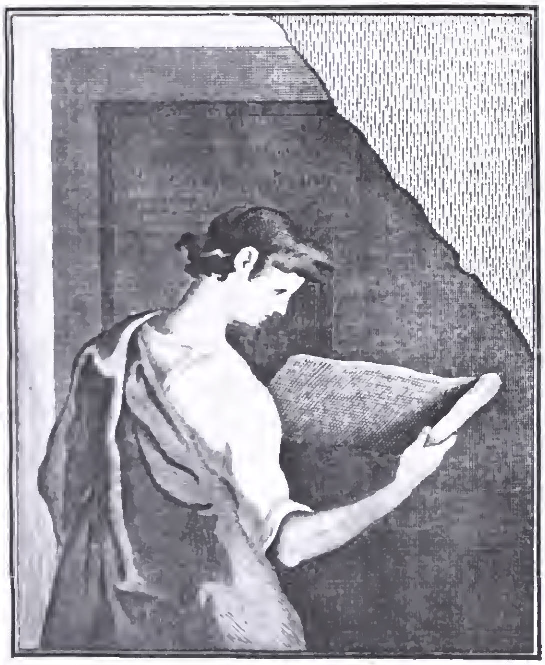

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SESSIONAL PAPERS

OF THE

ROYAL INSTITUTE OF BRITISH ARCHITECTS,

Incorporated in the Seventh Year of William IV.

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PATRON . . . HIS ROYAL HIGHNESS THE PRINCE OF WALES.

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PAPERS

READ AT

The Royal Institute of British Architects,

SESSION 1866-67.

USUI CIVIUM, DECORI URBIUM.

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OPENING ADDRESS BY THE PRESIDENT,

ALEXANDER J. B. BERESFORD HOPE, M.P., LL.D., F.S.A.

At the Ordinary General Meeting of the Royal Institute of British Architects, November 5th, 1866.

GENTLEMEN,—Having by your kindness been for the second time called to the chair of this Institute, I have again to open the annual Session, and to review the position of the Society in regard to the noble craft of which we are the accredited representative within this Realm. My task is, under one aspect, more easy than it was last November, because, from having been personally engaged in all the work of the Institute during the past session, I can speak with the confidence engendered by personal responsibility. On the other hand, that responsibility makes the second year's address a more difficult enterprise to him who has the honour to deliver it; for when he makes his first appearance he comes forward with something of the assurance of an invited lecturer: the second time, he appears as an official, bound to show cause for what he may have performed in behalf of the Institute during the past period, and to plead indulgence for all that he has neglected.

To begin with a purely domestic matter, I have to congratulate you upon the doubt which may have existed as to our right to prefix the vocable "Royal" to our style, having been solved by Her Majesty's own gracious and direct permission to use the appellation. This Session will be marked by certain alterations in our *personnel* which are needed to give more efficiency to our operations. It will not become me to say more upon this head than to assure you that while fully convinced of the desirability of the change, I almost regret that we shall no longer show the world the example of so much done by a staff so nearly honorary in all its organization.

Last November, I touched upon the relative functions of the Institute and the Royal Academy. The intervening year has been eventful for the latter body, for 1865 had not closed ere the chair of the Academy fell vacant by the decease at Pisa of its beloved and honoured President, Sir Charles Eastlake. Of the merits of that admirable man it is hardly necessary that I should speak to any who enjoyed the privilege of his acquaintance; but our transactions, I trust, penetrate beyond our own circle and island, and I should regret that this address did not contain our formal valediction of one whose name will long endure among the famous men whose praise is written in the history of British Art. The distinguishing characteristic of Sir Charles Eastlake's bearing, was a certain sweet and grave judicial evenness; kindly but firm, choosing with deliberation its times for speaking, and speaking then in the tones of one who claimed attention in right of his knowledge and forethought. A man so gifted, was of course eminently suited to be an efficient administrator in difficult times, and such were the latter days of the last President of the Royal Academy. Sir Charles Eastlake's place has, I am glad to say, been filled by the election of an Academician who has shown himself a vigilant sentinel of artistic independence, at a crisis which has put his courage to the proof. It is not many months since the attitude of art politics in regard to the Royal Academy and to the National Gallery was an object of anxious thought to all impartial bystanders. The late Government was desirous, to its credit, to terminate the long paralysis which had crept over the material future of these two institutions. It made—I am no longer speaking the language of laudation, but simply chronicling facts—its policy hinge on the expulsion of the Royal Academy from the building in Trafalgar Square, which was then to transferred in its entirety, with something more, to the National Gallery. The administration had not very long before advocated a different policy, and proposed, while leaving Trafalgar Square to the Academy, to build a National Gallery in the garden of Burlington House. The sincerity of my regret at the failure of this scheme will not be doubted, because Lord Palmerston's Government was induced to reconsider the proposal by pressure from the party with which in political questions I am accustomed to act. But art ought not to follow suit to general politics. We shall have to recur to the question as it affected the National Gallery; at present we are concerned with the fortunes of the Royal Academy. The edict of expulsion had gone forth, and a new position was offered to the Academy somewhere upon the site of Burlington House and of its grounds, on terms so lax as to involve either the destruction of its garden, which nobody wants to keep, or of the house and colonnade, which would have been a decided architectural loss. Happily, as events have proved, for the preservation of that monument of eighteenth-century architecture, but at the same time somewhat inexplicably as far as its own interests were concerned, the Academy, after a little hesitation, declined the Burlington site. Then there spread a rumour that a large area at South Kensington was placed at the disposal of that body on advantageous terms. The offer was undoubtedly liberal, and there might have been reasons for closing with it; but the scheme was obviously unpopular, because its essential element was the removal of the existing Exhibition of modern pictures from the centre of bustle and population, to a spot which its best friends cannot deny is both suburban and exclusively inhabited by gentlefolks. An episode intervened of an unsuccessful attempt to induce the House of Commons to revoke the decision to which it had come in 1864, while in the meanwhile the Burlington House Gardens site had been reduced by the cession of its northern frontage, lying between the Arcade and Albany, to the University of London. Still between Burlington House itself and this proposed building, ample room existed, not perhaps for the construction of a National Gallery, but for the purposes of the Academy, while Lord Burlington's own mansion stood available for offices and vestibule. Accordingly, at the close of the Session, the Academy, while finally declining to move to South Kensington, expressed itself willing to accept this space, subject to the retention and adaptation of Burlington House itself, leaving to the Government to keep and utilize the other buildings flanking the court yard. The Academy Galleries are in the hands of one, alike honoured here and amongst our distinguished allies, Mr. Sidney Smirke, while the court yard and flanking buildings are entrusted to the able manipulation of Messrs. Banks and Barry, who will have to consider the conversion for the uses of various learned societies of the two flanking wings, the curved colonnades and the solid screen towards Piccadilly. The decision to which they may arrive, is of course the business of the First Commissioner of Works. As to the treatment of the wings there can be but one opinion, namely, that those structures are the great blot of the whole composition, and ought under any circumstances to be rebuilt. On the contrary, the demolition of the colonnade would, I venture to say, be artistically a great misfortune; whether or not it be a necessary sacrifice to the Baal of economic retrenchment, this is not the time nor the place to settle. The screen towards Piccadilly being heavy, though symmetrical in composition, and physically obstructive, is unpopular with the public, and its removal or vital alteration seems settled. Against the expediency of freely handling this member of the group I have not a word to say; while I think it due to the taste of those who built it, to observe that for their object, namely, the construction of a wall to serve as a complete screen between a private house and the street, it is a work of architectural merit. Our age is less exclusive, and the house is to become a public and not a private building. Nevertheless, if one of our contemporaries were called upon to build a veil-wall, it is quite within possibility that he would produce something quite as heavy as, and less thoughtfully balanced than this often-abused screen. In spite of the physical proximity of the new University of London to the Burlington House group, there are no two structures which it is more absolutely impossible to comprehend in the same view, and therefore our friend Mr. Pennethorne, to whom it has been entrusted, has wisely undertaken to carry out a totally independent design.

When the Royal Academy finds itself established in a mansion of its own, and master of its own times and actions, it will act with wisdom if it sets itself to consider seriously the position in which it annually places itself by adhering to the programme of an architectural exhibition which meets with so limited a response. I blame no one; I willingly admit that better success in Trafalgar Square might have been impossible; but we look for and claim other things at Burlington House. In the meanwhile, the Architectural Exhibition, which is our own co-tenant under this roof, having made a fresh start, with a new constitution, merits our best wishes and hearty co-operation.

I revert to the National Gallery. The result of the late Government's decision was to fix its permanent home in Trafalgar Square, and after the discussions of the past Session, this result remains unchanged. Fortunately, there is but one opinion in or out of Parliament, that neither in size, arrangement, nor external appearance is the structure worthy of its destination, even after the appropriation of the half now used by the Academy. The one grand feature, Wilkins's double central Hall, fell a victim some few years since to an energy of patching emanating from Lord Palmerston's Government. The purchase of the workhouse behind the Gallery, of Archbishop Tenison's school, and of several houses, combined with the removal of the barracks, is a costly method of meeting the objection which exists against the physical capacity of the existing pile to contain a collection which our just national pride leads us to hope will not in the twentieth century be depreciatorily quoted after Rome, Paris, Dresden, and Berlin. However, we have met here to-night as artists, not tax-payers, and so we do not complain of this expenditure. It will be an outlay that will show results for the money spent, for with the addition of that area an ample space will have been obtained for the Gallery, with means of securing a magnificent façade towards Trafalgar Square. This opportunity of reforming the north side of Trafalgar Square, as I may notice by the way, is an advantage which would have been equally within the power of, and which I trust would have been made compulsory on the Academy had it been fortunate enough to have retained its present position. The mass of building behind will of course be a contribution to London interiors, but not to the artistic aspect of the streets. The then Government was sufficiently awake to the importance of the undertaking to determine upon selecting the architect by competition, and it further decided on a limited competition. I know too well the delicacy of the subject to risk making this the opportunity for raising a discussion on the comparative merits of limited or unlimited competitions. There is one stage in the discussion on which all who care for architecture must agree, and upon which this Institute made its formal stand when called upon to have an opinion in the course of the discussion of last Session. Those who support and those who oppose competitions, those who wish competitions to be unlimited, and those who prefer that they should be limited, must all agree that when a competition exists and is not unlimited, there has arisen the necessity of a sufficient number of competitors being invited, to secure the undertaking being alike advantageous to architecture, to the public, and to the object in view, both in the stimulus to art, which such a competition is designed to give, and in the good results of a building of which the city in which it is to stand, and the nation may be justly proud. The competition for the National Gallery was to be a double one, each competitor having to tender a project for the alteration of the existing building, and also for a completely new design, and the number of candidates originally named was six. It happened that in the other great competition of the year, that for the Law Courts, the number six had also been selected. The Council felt that in neither case was the number sufficient; but there were certain complications in regard to that for the Palace of Justice, which did not exist in reference to the National Gallery, and we accordingly thought it wiser to limit our formal petition to the House of Commons (which I had the honour of presenting) to one in favour of extending the number of competitors for the Gallery, with, however, a manifest spirit of desiring to cover the entire controversy. Independent members of the House of

Commons took the question into their own hands as regarded the Law Courts, and the broad result is that for either building a selected list of twelve eminent competitors was arranged; and that the double adjudication upon their designs will no doubt be the great architectural event of the coming Session. I may here observe, that in the course of the parliamentary discussion, I ventured to throw out, with all diffidence, the question of the possibility of the adoption, under certain circumstances, of a system of competition combining the principles of limitation and openness, by retaining a selected body of invited competitors, and yet permitting those architects who liked it, at their own risk, to enter the lists against the chosen few, with no claim for remuneration on account of work performed in getting out their drawings if unsuccessful, but with an equal one to be named if most deserving, for the actual construction. I do not here press the notion, though I have recurred to it as a subject which may be worthy of the attention of the Institute, guarding myself by the premise that I suggest it as for the present necessity, and not as theoretically and ideally just and desirable.

I must now trouble you with a few words of personal explanation. As you know, I moved the House of Commons to reverse the decision of two years since, which closed Burlington House to the National Gallery. The success of that motion would have been fatal to the Trafalgar Square competition, and yet I had been working in your name and my own to make this competition broader. Still, I venture to plead that there was no real inconsistency in my proceeding. On general principles of art policy, I was led to the conviction that a certain scheme was faulty, and I opposed it accordingly. Faulty, however, as the scheme might have been in its broader aspect, it carried with itself the incidental benefits which might accrue from the competition. So long, therefore, as the scheme was a *fait accompli*, as it is now destined to be, it has been, and it will be, my duty to deal with the incidents of the new building in Trafalgar Square, as a question to be treated within its own four corners with a single regard to the advantage of that building in itself, and in relation to the site which it occupies.

I was just observing that there were certain complications attaching to the competition for the new Law Courts. These were of an administrative character, and owed their origin to the fact that the Government had handed over no inconsiderable portion of the control, which in the case of most public buildings would have been shared between the Treasury and the Board of Works, to a Special Commission, created by Act of Parliament, and comprising a large infusion of the legal element. These gentlemen set to work with a very sound principle strongly before them, and, as was not unnatural, rode that principle a little hard. They assumed that the successful architect (or architects) ought to have made himself practically acquainted with the working of the different Courts of Law, and the inference which they drew from this undeniable proposition was, that it was needful for them to be excessively restrictive in the number of competitors chosen, in order to prevent the business of the Courts from being interrupted by the frequent visits of curious investigators, and so they drew the line at six. This was palpably, in the eyes of all men, except the Commissioners themselves, an extravagant application of their principle. Not to allude to any other objection, this restriction manifested considerable confusion as to the artistic obligation, contracted with the national honour, to produce the best attainable building. However, it required a vote of the House of Commons to overcome the reluctance of this most respectable Junta. The majority in favour of extending the number was decisive and totally devoid of party complexion, and the Commission of course capitulated. So the number was raised to twelve, while a parallel extension, indirectly occasioned by that division, enlarged, as we have seen, the list of competitors for the National Gallery to the same limit.

Last year I had occasion to express my anxiety that the coming Palace of Justice might be worthy of its destination and of the empire. This year I can confidently say that the list of competitors gives the material guarantee that the building will fulfil the expectations of artistic patriotism, provided only the judges show themselves competent, and Parliament, in years to come, is wisely generous enough not to grudge the necessarily large sums requisite to bring so grand a work to its legitimate completion. I have, I feel, lingered somewhat long upon this subject. But it is one of so much importance, not only in regard to the buildings affected, but to the great question of the relations which ought to exist between architecture and the executive, that I have no reason to offer any apology for making it a prominent topic in this address.

I have now to call your attention to the prospects of British architecture, and of the cognate arts at the coming French Exhibition. You need not that I should repeat to you the history of that Joint Committee of this and other Architectural Societies which has, I believe, in some form or other, come before almost every meeting during the past Session. You know that, after many incidents, mainly traceable to the tenacity with which the French authorities, who are, of course, supreme, have, true to their national character, clung to their own system for regulating the details of other countries, our Committee has been recognised by the British Commissioners as the body on which it relies for accomplishing the Gallery of British Architectural Drawings in the Fine Arts Department (Group I.), and also (though with a less degree of official recognition) as organizers of a Court of Manufactured Productions referable to Architecture and the Cognate Arts to be comprised in Group III. Our Committee was disappointed at finding that we could only have allotted to us a space of 1000 square feet in this third group. However, the Ecclesiological Society obtained 700 more, and by the terms upon which the Joint Committee was constituted, this allotment was handed over to the common stock, while the authorities at South Kensington promised to forward our views by placing the two allotments so close together as to enable us to mould them into one Court. More recently, however, we have learnt that in return for this facility the joint space has to be reduced to 1428 square feet. Remonstrance would be needless; and so we are exerting ourselves to make the best of what we have got.

But out of these arrangements has grown a project, of which I am grateful to say that we owe the suggestion to Mr. Cole, which promises to be alike useful and full of interest. The tale of designs which we shall be able to exhibit at Paris will be comparatively small, while the number we should desire to send will be proportionately very numerous. In face of this difficulty the South Kensington authorities have undertaken to arrange for us a preliminary exhibition in London, commencing at the beginning of December, in the spacious range of galleries at South Kensington, which were during last summer, and will again next season, be occupied by the National Portrait Exhibition. The space is vast and the time convenient, and so we anticipate the opportunity of bringing together a mass of contemporaneous architecture such as has never before been put in the power of the English public to study. Those who hope to appear at Paris are invited to conform themselves to certain necessary and pressing regulations of size, but the Committee desire it to be known that they do not regard this exhibition as a mere tasting trial for Paris, but as one possessing a national character and scope of its own, and which therefore need be only limited by the space at their disposal. It will, it is expected, contain many designs tendered for Paris, and it will also embrace designs sent to be viewed in London.

A comparison of the list of the Institute as it stood at the close of last Session with that of the year preceding, will show a considerable increase in the section of Honorary Fellows. I think we ought to regard this circumstance with satisfaction, not so much for the material advantage which it is to our body, but for higher considerations, on which I shall not be deterred from dwelling, because, when out of this chair, I myself belong to that order. What is an Honorary Fellow? Technically and literally he is the partner in a bargain, of mutual convenience to himself and to the Institute. Morally, however, we may, I hope, see in every new Honorary Fellow a fresh convert to the importance of our noble profession, a fresh pledge that in the construction of all and every building, science and art shall bear their due proportions. It is no doubt the duty, as it is the interest, of the architect to please his employer, so far as he can do so without sacrifice of self respect. It is equally his duty to see that he is respected by that employer, in the same way and for the same reasons that the lawyer or the physician is, because the employer is convinced that the architect's technical knowledge carries with itself the guarantee of successful results unattainable by untrained cleverness. Now then, although a little learning is a dangerous thing where the half-taught empiric himself sets up as a practitioner, it is not dangerous in the hands of the man of sense, who is satisfied to appreciate and not to practise. On the contrary, it enables him to understand the value of things which are as sealed books to the wholly uninstructed. Applying this truth (I fear I should say this truism) to our own case, I contend that it is for our direct benefit that the knowledge of the general principles of architecture should be as widely diffused as possible among the educated classes. The time has as much passed away for our profession as for any other to be a mystery. We are constrained to live—and well it is for us to be under this constraint—in the broad day-light of general criticism, sometimes intelligent, sometimes prejudiced and ridiculous, but even when most prejudiced and ridiculous, far more tonic and useful to us than the ignorant silence of a careless and indiscriminating age.

This criticism—to use the word in its largest sense, as including oral no less than published opinion—we may make our own, or we may exasperate according as we show ourselves, on the one side proudly impenetrable or testily thin-skinned, or on the other, genial and tractable, but withal assured and tenacious of our principles. We build, it may be for our own fame, but also for the use of all that remainder of the world who are not architects; and, as those who use have a plain right to criticise, so it is far better for them to believe that their opinions will reach and be considered by the men on whom they are passed, than to imagine themselves prejudged to be gainsayers and malignants. On these grounds I congratulate this Institute upon the liberality of that provision in its constitution which admits the unprofessional element; and thereby truly makes us what we never should forget that we are, and what we should resolve never to cease to be, an Academy of Architecture as well as an Institute of Architects. The financial conditions which we impose upon the Honorary Fellowship, and the test of proficiency which we desire for Honorary Membership, if duly attended to, are sufficient to prevent the professional backbone of the Institute from being enfeebled by a liberal interpretation of the provisions of our Charter, which leaves it at our discretion to replenish those two classes without any fantastic limitation of numbers. In one detail only I would wish the Charter had been somewhat different. If the Honorary Fellow deserved from time to time to be called to the chair, I regret that the same privilege should not also have been secured for our Honorary Members.

It will not be out of place, in reference to the co-operation of professional and amateur lovers of architecture, if I dwell a little upon the relations which have existed hitherto, and upon those which I should be glad to see established, between this Institute and the Architectural Museum, or else some organization fulfilling the duties of that Museum. The Architectural Museum, as I am sure you will all bear me out in saying, grew out of a real and acknowledged want. It was founded in 1851, to meet a necessity which was even then palpable and increasing, and which has in the few intervening years become even more urgent, owing to the growth of national wealth and of artistic literature, both of them combining in a remarkable manifestation of architectural luxury. Sculpture was then beginning to revindicate its rightful prerogatives as the first handmaid to architecture, and the need was pressing for a trained school of architectural carvers of a higher grade than mason's men, but still unencumbered with the usual apparatus which has grown up round the professed sculptor. Primarily no doubt, in the purview of the founders of the institution, the demand was for a staff of carvers of Gothic stonework; but still, above all, of carvers who should show some perception of expression, and of anatomy, when called upon to place a figure upon a building, irrespective of the figure being draped in toga or whimple, or left to the light simplicity of nature. The necessity of an improved school of wood carvers was, of course, equally apparent, and came alike within the scope of the undertaking. Two things were requisite really to set up such an institution in working completeness—a good collection of examples, and systematic teaching. Of these the collection was the one which it was easier to provide; for its rudiments existed, partly in the specimens possessed by private hands, and partly in the facility with which the casts of desirable examples could be obtained. Systematic teaching, on the other hand, involved the organization of a staff of masters, while the class to be instructed was not one which it was very easy to bring to school. Accordingly, the new institution came into existence as the Architectural Museum, and not the Architectural Academy, with a great many casts, and a picturesque cock-loft wherein to store them. At the same time, as much teaching as could be drawn from the unsystematic friendliness of volunteer and often amateur lecturers was superadded; and prizes to art-workmen were set on foot. Out of all these elements the complete intended Academy of Architectural Art might have grown up, if only sufficient funds had been forthcoming. But the financial shoe never sat quite easily upon the young Museum, and after a short though spirited period of independent existence, it succumbed to an arrangement, which it would have been Quixotic, under all the circumstances, to have flouted, but which from the first has proved a source of numberless complications. You need not be told, that this was the morganatic alliance which the Architectural Museum contracted with the South Kensington Museum, whereby, in return for house-room and certain privileges, personal and financial, the private made loan of its property to the public institution. Of this connection with the South Kensington Museum I have no desire (as an officer myself of the Architectural Museum) to speak in any other than grateful terms. There have been from time to time rubs, but we have met with a great deal of kindness and much material assistance. Still the alliance was one which carried within itself the seeds of failure, except upon one condition, in which indeed I never could see any antecedent or theoretic incongruity, but which from first to last, through many accidents of negotiation, passed into every conceivable phase of practical impossibilty. It seemed to us that—as the South Kensington Museum was expanding into a wide miscellaneous national collection of objects, both of scientific study and of art demonstration in its widest signification, divisible into many branches, and respectively capable of being independently administered—the Government (which assumed the direct control of the whole institution) might relax its bureaucratic grasp of one of those branches, and leave it to be administered, under due inspection, within the walls of the new Museum, by a private corporation. In the Council of the Architectural Museum a body of men existed, willing and able to become the curators and directors of a national collection of architectural art, while towards making up that collection both the South Kensington and the Architectural Museums were stakeholders of valuable materials. From the very first, however, my Lords of the Committee of Council turned a deaf ear to any such suggestion. They were anxious, as they told us, for an Architectural Museum, as an important component part of the great collection, whose name is borrowed from the suburb in which it has been placed, but the whole administration of that great and varied collection was to be, like the French Republic, one, indivisible and bureaucratic. They were ready to house the Architectural Museum casts and to decorate those casts with a distinctive label of ownership, but in return we were to surrender them on loan. Of this condition of things, difficulty was of course, with the most friendly intentions upon either side, the inevitable result. The vital powers of the institution—its capacity of growth—were smitten with paralysis; for how could it even procure fresh specimens, when on the one side we could not be sure whether those would be well received by our hosts; and on the other, whether those hosts might not themselves be intending to take the same casts, to the saving of our own private purse. The result, to make a short story, was that while our individual casts continued, for many years, to do good duty as models for study at South Kensington, they did so not as a valuable and distinct constituent contributed by private enterprise, but as scattered fragments of the general amalgamation of noticeable objects. The hearts of its real proprietors were chilled towards the collection in itself, while with a genuine anxiety to do justice to their favourite study, and to those whose contributions they were inviting, they virtually resolved the Museum, while still retaining its now somewhat incongruous appellation, into a committee for providing popular lectures at South Kensington on architectural subjects, and for stimulating the zeal of art-workmen by annual prizes. The lectures, many of them by persons of considerable eminence, were very miscellaneous in subject and treatment, and the audience comprised members of most diverse social classes. Accordingly they did much unsystematic good, in cultivating art-feeling, alike among the easy and the working members of the community. The prizes also which ranged over every description of art-workmanship, have, upon the whole, decidedly tended to raise the workman standard, and to consolidate personal intercourse between employer and employed, though more than once the particular result of the year's competition has been a disappointment.

Such has been the so-named Architectural Museum, in the days of its intimate connection with South Kensington. That connection is now to be severed, as far as the collection goes, and the Society has for itself secured an advantageous site whereon to build its own abode, close to Westminster Abbey. The lectures and prize-giving may or may not be still continued at South Kensington, supposing the body to maintain its independent constitution; but for all practical purposes, I believe that the Architectural Museum might advantageously abdicate a separate existence, if only some more powerful institution could be found willing to undertake the various duties which it has hitherto discharged. It is, I suppose, no secret in this Institute that a conference, necessarily informal, was held during the late Session, between members of our Council and representatives of the Museum, to consider whether the Institute could not so far expand its organization as to cover the ground from which the Museum might then gracefully retire. This conference did not meet with the intention of coming to any definite resolution; and it therefore deliberated with freedom, and broke up, I believe I may say, with the general idea that there was nothing impossible about the project—provided only that due care were taken not to hamper either the general funds, or the chartered functions, of the Institute by new and voluntary responsibilities. It would be clearly to our own credit and dignity, and to the advantage of architecture, if we were the possessors of a Museum of Architectural specimens, whether under this roof or in other convenient premises. All that would be needed, would be some moderate distinct income from subscription or endowment, sufficient to make it reasonably probable that no calls would be made upon our statutable revenue. We should, I am sure, be all of us glad to be the managers of some series of lectures of a more popular character, and appealing to a more miscellaneous audience than our formal course of annual papers, provided only those lectures did not starve or hamper the papers; and I think we should none of us refuse the trouble of adjudicating prizes for those art-workmen on whose proficiency we are so dependent for the satisfactory effect of our works, if only the donors of those rewards put it in our power to distribute them according to regulations made in concert with our Council. Why then not fairly see whether the time has not come for a popular development in these three directions? Each would have to rely for the sinews of war upon its own separate account; of which the lecture and the prize accounts, at all events, need not be very large, and that for the collection might, to a considerable extent be self-supplying, through a system of moderate fees. Each might be worked by a separate committee, on which a certain number of our Honorary Fellows and Honorary Members might be invited to act, so as to give that portion of our body some share of administrative work, without trenching on the provision of our Charter which leaves the government of the Institute itself in the hands of its professional members. When I add that among the governing body of the Architectural Museum are found many of those whom we most honour and respect in this room, I have said enough to show how easily the change might be made. The Architectural Museum would, I believe, gladly and without any haggling hand over its collection to the Institute, happy to terminate its separate existence by so useful and so honourable a *euthanasia.*

You will, I conclude, have noticed the programme of prizes for the forthcoming year, which the Council has proposed. I beg briefly to direct your attention to two out of the list of subjects. The first is the prize which we offer for the best design for a Gothic theatre. The affection which I bear for Gothic is a secret to no one, and I should be sorry to deny it, for I have striven not to let it interfere with the duty of equal administrative justice towards the wide world of architecture, irrespective of school and style. I may accordingly, without risk of being misunderstood, say that I shall look upon the responses which this proposal may elicit with peculiar interest. In the first place, I regard it as the assertion of the sufficiency (I do not say superiority but sufficiency) of Gothic for any constructive need, secular as well as spiritual, recollecting as we do, that men did not only pray but also did work, think, govern, and play, from the eighth to the seventeenth century. But in the second place—here speaking an individual opinion—I look upon the peculiar adaptability of Gothic to the modern theatre as a point which our modern Gothic architects, have either overlooked or have not had the opportunity of developing. Every one knows the type of the classical theatre; a day-light place, with its receding rings of open benches, its official allotment of seats, and in Greece, its connection with stated religious festivals. The modern "*salle de spectacle*," on the contrary, when true to its own type, is a chamber to be used by artificial and not natural light; in which the general community does not assemble at any stated times and in corporate array, but by person, or by family, when and as it likes. Now then, what structure best responds to this demand out of the various forms in which the modern theatre has been cast? Is it the one in which the necessary tiers of boxes stick out like trays from the wall, or that in which every lower story legitimately throws up its shafts to support the one above? No one who considers the question can hesitate to accept the latter, both for beauty of appearance and constructive excellence. Now then, where do we find the nearest example of such curvilinear mid-air galleries? Not in the theatre of Bacchus, or of Pompey, but,—let no man charge me with irreverence, viewing as I am, the question from a purely constructive stand point,—in the triforium which encircles the apse of some cathedral of the thirteenth or fourteenth century? No doubt the shafts will most often be of metal; but a metal triforium is a development of which the idea may be more readily found in a stone triforium than in a semi-circle of receding benches. For these reasons I venture, in the name of progress and of eclecticism, to call on all here present to aid in vindicating the theatre no less than the church as a legitimate object for Gothic treatment; at the same time I conjure the competitors to consider seriously how they may reduce the risk of fire.

Another of our prize subjects was suggested by the proximate meeting, of which I shall have something to say further on, of the Archæological Institute in London. It is the restoration of old St. Paul's Cathedral. The materials for the competition will, as all our students are, I trust, aware, be found in the vigorous engravings with which Hollar illustrated Dugdale's History of that Cathedral. In them enough is given to provide the key to every portion of the church, as it existed in the days of Charles I., and the Commonwealth, but no one feature is depicted with an attempt at what we recognize as architectural accuracy, while the structure itself that is exhibited is St. Paul's after generations of neglect, and the destructive restoration perpetrated by Inigo Jones. Enough therefore exists to give sure guiding, and not enough to reduce the work of the sagacious and erudite student to the servile labour of a simple copyist and compiler. It would be, I am certain, a great satisfaction to the Institute, if any set of designs were sufficiently good to justify it in advising their author to publish the series, and thus bring back to the minds of our generation the details of a minster, which, as I believe, from its noble length, the solemn Norman of its nave, the developed and rich Gothic of its choir, and the majesty of proportion with which the English system of a square east-end was carried out, must have been more like Ely Cathedral than any other of our known great churches.

The recollection of Old St. Paul's naturally leads to the general question of the Conservation of Ancient Monuments, which we have wisely and boldly claimed as a portion of our stated mission by the appointment of a committee specially charged with this department. The case in which its exertions have come most prominently before the public during the past year has unfortunately not been one on which we can report a very successful issue; I mean the protest, which, in common with other societies, we addressed to the authorities of Lincoln Cathedral against the deplorable scraping of their noble minster. Out of this protest, not from our fault, nor from the fault of those with whose judgment we coincide, has arisen an acrimonious personal controversy. I therefore refrain from entering further into the details of the calamity. But, without trespassing on the dangerous ground, I think we may profitably draw from it some general lessons of an encouraging character. Granted that Lincoln Cathedral has been spoilt, it is at all events some consolation to observe that so many sections of people have so intelligently observed and so strongly protested against the precise manner of its spoiling. No state-restored public building on the continent would have been so defaced by authority with the reclamation of more than a few uninfluential opposition archæologists. Thirty years since in England itself an outburst of indiscriminate scraping would be accepted by clergy and commonalty and antiquarians alike, as a proceeding stamped by unquestionable good taste and reverence for antiquity. I am well aware that since the era of restoration set in, a suspicious and not always quite amicable feeling has sometimes been manifested between the archæologists and the restorationist school of architects. The archæologists looked upon the architects as somewhat destructive, and the architects treated the archæologists as rather obstructive. Happily the antagonism is now at an end, or I should not have alluded to it. There was, I fully believe, some room for either suspicion. Archæologists were at one time impracticable and architects reckless. Human nature would not have answered to its own identity had not these phenomena been observable. The formal recognition of the pacification came from the side which was originally the alarmist one—that of the archæologists, and it therefore carries with itself the elements of stability. The site was in the churchyard of Sherborne Minster, and the speaker was Professor Willis, at the Dorchester Meeting of the Archæological Institute, in the summer of 1865. It is not an uninstructive illustration of this declaration that those who have most loudly protested against the Lincoln restoration have been leaders of the restorationist party.

In other places our intervention has been efficacious. The stone choir screen of Christchurch Priory, Hampshire, necessary as it is to the impressive and nearly unique choir of that fine church, has been saved, for which, in the first place, we owe our thanks to Mr. Ferrey. The church of St. John, Leeds, very noticeable as being in its structure a grandiose and picturesque example of the revived Gothic of the seventeenth century, and in its woodwork one of that English continuation of Cinque Cento, which is usually known as Jacobean, has also been rescued from the destroyer, and will, I am sure, in the hands of Mr. Norman Shaw, present a true example of conservative restoration.

Another question, involving as it has done a matter of professional practice, as well as of the preservation of a very valuable ancient monument, has been taken in hand by the Council—I mean the treatment by the Corporation of Bristol of the prize designs of Messrs Godwin and Crisp, for the new Assize Courts of Bristol, and for the preservation within them of the Mediæval house, known as Colston's. I believe that the best preservative against the repetition of such scandals as have discredited that and other competitions, is that more general acquaintance on the part of the public with the principles of the architectural profession, which I have already had occasion to advocate. So long as the arrogance or greed of the patrons of any competition finds itself supported by the uninstructed public opinion of persons who have never yet really learned to treat architects as gentlemen or men of sense, so long will the scandal continue. Let the world give the architect his true status, and then he will find himself the master of public opinion, not its enemy. Might it not be worth our while to publish some paper, bearing the official mark of the Institute, short enough for the general newspapers to give it insertion, and clear enough for every one to understand, in which we lay down certain general rules of competition, outside of which no architect could compete without losing caste, and no patrons institute a competition, and be able then to say that they had acted with fairness and generosity?

But I turn to a more agreeable topic, and I invite you to record your gratification at the commencement of a work of restoration, which alike for the beauty and value of the structure itself, and for the national character of the enterprise, deserves especial commemoration. You will anticipate that I am speaking of the Chapter House at Westminster, and will not require any description or encomium of the building. The cheerful unanimity with which the House of Commons recognized its responsibility towards the chamber, in which for more than half the existence of that august assembly, it had been wont to gather, must be noticed as an eminent example of that wise love for antiquity to which the English people hold fast. However much different members of the Institute may think differently of the political opinions of the late distinguished Chancellor of the Exchequer, all will, I am sure, unite in their gratitude to him for the earnest and effectual way in which he undertook this restoration, and carried it, as far as Parliament is concerned, to a success which is virtually conclusive and complete. In this he was ably and cheerfully seconded by Mr. Cowper, the first Commissioner of Public Works. I can as confidently claim your unanimity when I say, that I am certain that the ministers who have succeeded them will not fall short of their predecessors in their determination to see the Chapter House made good. To Dean Trench who originated, and Dean Stanley who carried on the movement must also be accorded the tribute of our hearty thanks for their substantial good services.

It was pleasant to observe that when once the squalid fittings, intruded in the last century for the use of the public records, had been removed, and the vestiges of the Chapter House stood out again revealed, so much of the old work should have been found to be either still existing, or traceable from sufficient indications. Mutilated as the chamber was, it proved to be essentially the Chapter House of Westminster, and not any modern trespasser run up within its walls. Accordingly the restoration is a matter of plain and easy architectural induction, while, no doubt, Mr. Scott will exercise a tender and conservative caution in his retention of the very stones and carvings of the thirteenth century, where the votaries of the French school of cléan and perfect sharpness would have ruthlessly substituted that which we should have been compelled to accept as modern fac-similes of originals smashed up in the mason's yard.

It is interesting to recollect, that the Chapter House was cleared out just in time to enable its appropriate house-warming to take place, in the meeting there of the Archæological Institute to listen to the lectures of the Dean of Westminster, and of Mr. Scott, upon the Abbey. I ventured last year to forecast the London Congress of the Archæological Institute as one of the matters which ought to interest our body in the course of the coming Session. I am now rejoiced to report not only that the Congress showed itself to be a most valuable incentive to the philosophical study of architectural archæology, but that it afforded the occasion for an extremely gratifying fraternization between our own body and the Royal Archæological Institute—two societies with so much in common, that a close alliance between them was plainly a thing to be sought and effected. In order to show honour to the

Archæologists we postponed our annual Conversazione till the end of the season, after the close of our own Session, in order that it might coincide with the meeting of the Congress, and enable us to act for the evening as its hosts. There was of course some risk about this postponement, but we had no doubt as to facing it; and the result more than justified our daring. Our rooms were crowded, and I have every reason to believe that the archæologists were as sincerely pleased at the opportunity of meeting us as we were to welcome them. One guest whom we should have been especially glad to greet was missing, the President of the Archæological Institute. In the decease of the Marquess Camden which so soon followed, the melancholy cause of his absence stood revealed. I am sure you would not be satisfied, if I did not take this opportunity of expressing our sympathy with the sister institute, at the loss of one who served it so heartily and so unselfishly.

I must not close without repeating the regret which we have already expressed, at the sad and sudden death of our very distinguished Honorary Member, Dr. Whewell, late Master of Trinity College, Cambridge. His is the only loss last year of a very eminent man within our own body, while English art has had to mourn the decease both of Sir Charles Eastlake and Mr. Gibson.

The Pugin travelling studentship intended to maintain, in memory of the great man whose name it bears, the study of Mediæval architecture, is now, I am glad to say, firmly rooted. It has been twice adjudicated. The first time only one claimant appeared; and so Mr. Tavenor Perry won it without a contest, while by the paper which he produced as its fruit he has shown himself full worthy of the distinction. This year we had several competitors, with such a good array of well-founded claims as to make the adjudication a question of substantive consideration.

I have mentioned some prominent questions affecting our pursuits, which came before Parliament during the last session. Other matters also engaged its attention in which we are more or less interested, among them the improvement of the dwellings of the labouring classes stands first. The wholesale demolitions perpetrated by different railways in London and other towns was the main cause which led the legislature to turn its attention to the subject. Let us trust it will be one upon which the eyes both of the upper and middle public and of the Government will be ceaselessly directed, for it is one in which, as a nation, we have as yet failed in our duty, both to our fellow creatures and to ourselves; to our fellow creatures as it is a matter of humanity, to ourselves as it is one of general health. I have also to notice the care taken for the protection of the integrity of the public parks and open spaces in and about the metropolis, noticeably shown as well in a general bill as in the resistance made to the erection of gas works in dangerous proximity to Victoria Park. What remains of Epping Forest is also to pass into the category of public parks, by being transferred from the office of Woods and Forests, which only regards the financial value of its trusts, to that of Public Works, which deals with them for the general recreation and the decorative improvement of the ground.

At last the administration of the River Thames has been reformed, whether efficiently time will show, and also, I hope, rectify any proved inefficiency. Beneficial as this reform is to the world at large, it carries with itself a special advantage to architecture, as it will render possible that vast system of metropolitan improvements, which turns upon the quaying of the river, about which we have all no doubt thought so much, and will have no doubt still to think a great deal more. Let me in passing congratulate the Metropolitan Board of Works on having laid the first stone of the Southern Embankment. One bill received the Royal assent, to which I should desire to call particular attention, as the first step towards the long-called-for opening between Whitehall and the Palace and Abbey of Westminster. This Act only deals with the one wedge-like block, in front of the new Foreign and India Offices, whose apex is the Irish Office, but in this case the proverb about the point of the wedge will, I trust, receive its literal as well as its metaphorical interpretation. I refrain from recapitulating single buildings and monuments, however noteworthy, in various stages of progress; but the grandiose rebuilding of an entire quarter of the town by the Marquess of Westminster, deserves especial commemoration.

I gave reasons last year why I regarded our architectural future with hopefulness; to these reasons I am able to pledge my continued and increased confidence. True to ourselves let us only be, and no selfishness, or stinginess, or ignorance displayed by the world, which is so largely our debtor, can check the architecture of Great Britain in its onward course of great and rapid improvement.

Mr. M. Digby Wyatt, Fellow, eagerly availed himself of the opportunity the call of the meeting afforded him, to express the pleasure which he and all those present must have derived from their President's animated and admirable address, and to propose a hearty vote of thanks to him for it. After the brilliant exposition to which they had just been listening, developing as it were the very pith and marrow of the architectural movement going on around them, any thing the speaker could add would be but poor and tame. He would not, therefore, attempt to follow out the train of thought suggested by any particular item or items, but rather draw attention to the one moral they must all feel had pervaded the whole of what the President had said. It was no less a source of congratulation for the present, than of confidence for the future, to recognize from how many quarters the breezes appeared to be blowing, which urged the architectural bark forwards to prosperity and success. It was in the confluence of a multitude of different circumstances tending towards the general purification of taste in this country, that the professors and practisers of architecture might look forwards with most confidence for the improvement of the art to which they were attached. On the part of some from congenital individuality, on the part of others from religious influences, and again on the part of a third section of devotees from dilettante or archæological promptings, there was an active, combined and harmonious movement towards the general advance of art now going on in this country of the most auspicious character; and it was delightful to see by how many simultaneous impulses or efforts all these elements were conducing to the common end which they all had at heart. Without going (at so late an hour) into the details of the illustrations so ably brought out by the President of this onward march, Mr. Wyatt could not but remark that it was a subject for much congratulation to have had these matters treated in the lucid manner in which they had been in the discourse to which the meeting had listened with so much attention; and he was quite sure all then present would heartily respond to his proposition of a hearty vote of thanks to the President.

Mr. Gilbert Scott, Fellow, had great pleasure in seconding the vote of thanks, though he believed such a formality was not necessary. Following up what Mr. Digby Wyatt had said respecting the address, he was perfectly incompetent to make the smallest attempt to go over the ground of the very numerous subjects which had been brought before them. He repeated what that gentleman had said—that they owed the President great thanks for the admirable manner in which he had brought forward so many interesting and encouraging subjects.

Mr. James Fergusson, V.P. had very little to add to what had been so well said by Mr. Digby Wyatt and Mr. Gilbert Scott. He thought the President had dealt with the main subjects of interest of the day in a masterly manner, and like Mr. Wyatt he felt, as every architect must feel, that their art was attracting more attention than before, and that there were distinct signs of progress everywhere, not only amongst architects but throughout the nation at large. People were no longer content with churches or dwelling houses of plain walls, pierced with holes, but ornamental art was demanded everywhere. They wanted men to think, men to appreciate, and men to demand, and when that combination took place progress was inevitable. With progress we would very soon be independent of Gothic, Greek, or any other style of art: the public seeing and learning to appreciate what was good would demand it and no longer be content with mere copies of extinct styles. He had no doubt the next ten years would witness such progress in architecture as would make it worthy of the nation and of the world. In that sense he felt grateful to the President for the able essay he had favoured them with.

Lord Houghton, D.C.L., Visitor, remarked, that all he could say was to re-echo what had fallen from the gentlemen who had preceded him—that the interesting essay of the President was one which possessed the double merit that it had not only attracted and pleased this large audience on matters on which they were specially informed, but he was quite sure it would be well received and excite great interest in the world at large. The question of architecture had frequently come before that assembly of which both the President and himself had been members, but he thought they would agree with him, that it was difficult to imagine an assembly less fitted to discuss such questions. It was, therefore, with very great pleasure he saw the President return to that assembly again, because he (Lord Houghton) believed that his presence there, and that of two or three other competent men, was of immense importance in the discussion of these matters. They were as well aware as he could be, how upon a gust of accidental passion, or some foolish incidental circumstance, even of party strife, might sometimes depend questions of art which were of the greatest importance to this country and to posterity: therefore, he said, the presence of such a man as the President, who could recall the House of Commons to its bearing when those feelings were predominant, might really be said to be invaluable. He would not mix up the question of the merits of the different localities of South Kensington, Burlington House or Trafalgar Square. If they had been decided upon on their merits in the House of Commons no doubt they would have come ultimately to the best decision: but tossed about as they had been from year to year, he could only say he was thankful they had come to any issue whatever, although it was not the one he should have chosen. He joined with the gentlemen who had spoken in thanking the President for his interesting address, from which he was sure he (Lord Houghton) and the public at large would derive a large amount of information.

Mr. George Godwin, F.R.S., Fellow, was happy to have this opportunity of re-echoing one of the practical points which arose from the President's admirable address, which had been duly commended, and of which he need speak no further. It was with reference to the coming competition for the designs of great public buildings in London. He looked with the greatest anxiety, and he was sure gentlemen who knew anything about it felt the same anxiety, as to the nature of the Committee which had to decide upon those designs. It was a most important point. Parliament would not meet before those designs were sent in: whether it would meet before the adjudication upon them took place he could not say. Therefore efforts through other channels ought to be made to obtain a proper court of adjudication. It was downright nonsense to expect three or four amateurs—whether noblemen, honourables, or simple members of Parliament—to judge of the merits of such designs as those which were going in. Such, of course, could only produce dissatisfaction, and it was to be feared bad results for the country. They had but to look at the constitution of juries on such matters in France. A certain number of literary men, a certain number of painters and sculptors, and two or three men of intelligence representing the public, formed the jury. [Mr. Fergusson:—One or two architects.] Of course a certain number of architects as well. There was seldom any question as to the decisions of those juries; and with that fact before them, coupled with the further fact that almost every adjudication on public artworks here did disappoint the public, it should lead the ruling powers to appoint a proper jury in which the country would have confidence. He was therefore anxious that some course should be taken to appeal to Mr. Cowper. [The President:—Lord John Manners.] He believed Mr. Cowper was still a member of the Committee of Adjudication, which was composed of a certain number of gentlemen for whom he had the highest respect, but to commit to them the final decision upon the plans for the National Gallery and the new Palace of Justice, could only ensure a failure. Therefore he thought some memorial should be addressed to the right quarter, asking for a proper jury to adjudicate upon this matter. On this subject he hoped he expressed the opinion of the members generally. Half a dozen other subjects of interest were embraced in the President's address: amongst others that of the Architectural Museum. That institution was parting from the Government; he regretted it, but supposed that it could not be avoided: they must not, however, part from the Architectural Museum. If the Government would not maintain it the architects, the art-lovers, and the art-workmen of the country must do so. There was now an opportunity to put up a suitable building, and they must endeavour to find the money for it, and he favoured the notion hinted at of bringing this Institute to take charge of it. He agreed most cordially with all that had been said as to the excellence of the President's address, and that the thanks of the Institute were eminently due to him for having delivered it.

The vote of thanks to the President having been passed by acclamation,

The **President** rose and said he had received the greatest and highest reward that any author could do in feeling that what he had said had been acceptable to those whose good will and respect were so dear and precious to him. With regard to what had fallen from Mr. Godwin, he heartily echoed all which that gentlemen had said as to the necessity for a proper tribunal to adjudicate upon the two forthcoming competitions. He would try to explain how the matter stood. He was afraid, unless some alteration were made by the present Government, those six selected names must be the stereotyped judges of the competition for the New Law Courts, as their appointment was part of a parliamentary arrangement. No judges, he believed, had yet been named for the competition for the National Gallery, but that the matter rested in the hands of the present First Commissioner of Works. He could assure them from what he knew of Lord John Manners, who was one of his oldest and most intimate friends, that the minister was fully alive to his responsibity, and that the most earnest and anxious care would be devoted by him in the selection of a proper tribunal of adjudication. At the same time Lord John Manners's hands would undoubtedly be strengthened by an expression of the feeling of this Institute such as had been suggested by Mr. Godwin—not worded as doubting his Lordship's goodwill and desire, but as anxious to support him in appointing such a body of judges as would be satisfactory to the competitors and the public at large, and which would carry with it the earnest of a good building for the purposes to which it was to be devoted.

Lord **Houghton** enquired who had nominated the judges of the designs for the new Law Courts?

The **President** replied, Mr. Gladstone, Mr. Cowper, and Lord Cranworth. The Law Courts were to be carried out by a special commission named in the Act of Parliament.

Mr. **Digby Wyatt** had suggested the propriety, upon the designs being sent in, of the lay judges so nominated procuring immediately a professional report upon them to assist the adjudicators in their labours. It was highly desirable that they should be put into possession of such information as an experienced architect could alone give them, not only before they should decide, but even, if possible, before they should commence their own examination of the drawings submitted.

The meeting then adjourned.

Bedgebury Park,
Cranbrook.

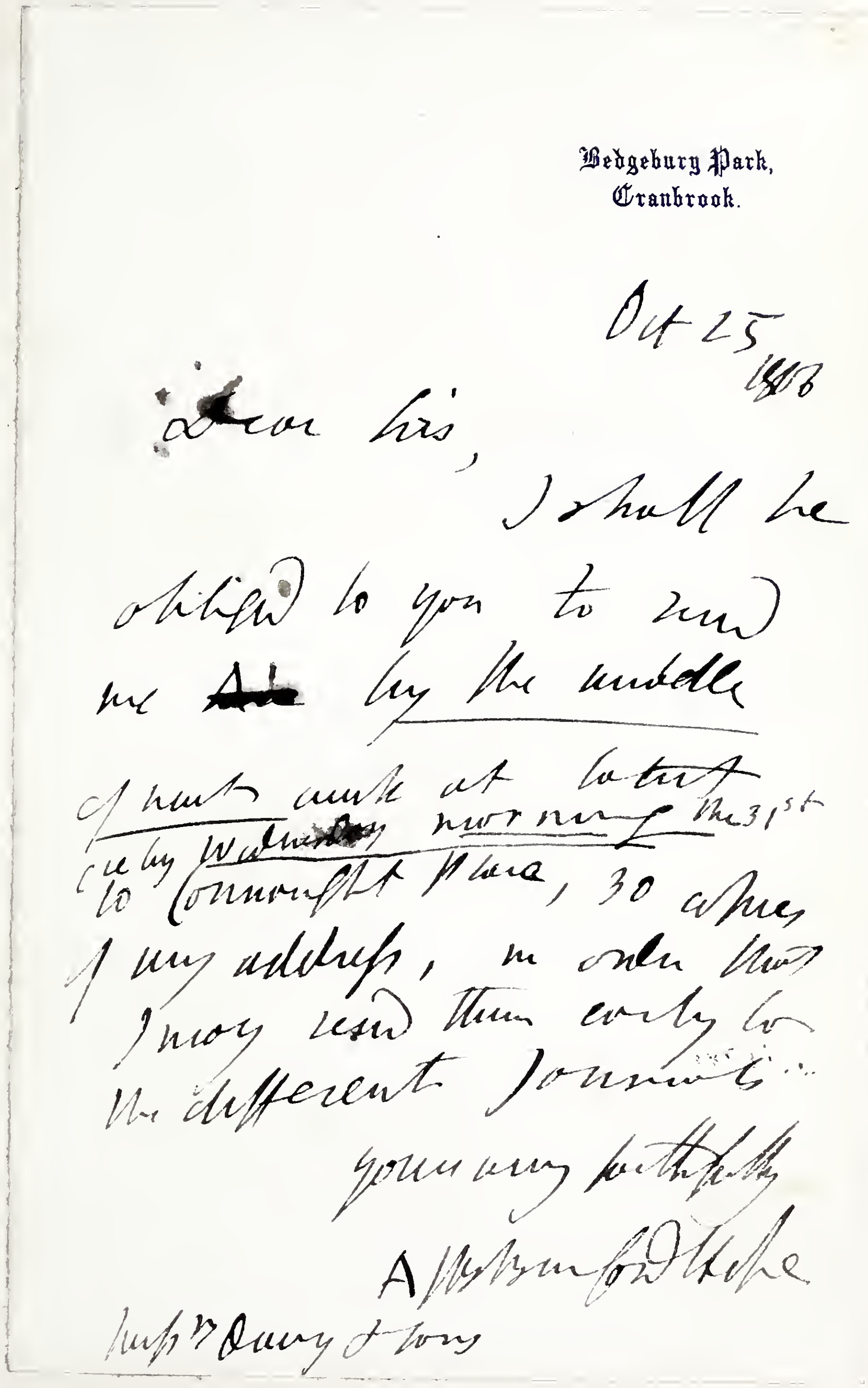
Oct 17 /66

Mr Beresford Hope presents his compliments to Messrs Darcy & begs to inform them that he has forwarded to them by this post by Book Post, the corrected proofs [illegible] of his opening address R.I.B.A. & he w^d be much obliged to them to send

Bedgebury Park,
Cranbrook.

Oct 22/68

Mr Beresford Hope
presents his compliments
to Messrs Davey &
returns the above —
In a few days he will
write about Early album



Bedgebury Park,
Cranbrook.

Oct 25 1866

Dear Sirs,

I shall be obliged to you to send me ~~[illegible]~~ by the middle of next week at latest i.e. by Wednesday morning the 31st to Connaught Place, 30 copies of my address, in order that I may send them early to the different Journals.

Yours very faithfully
A J B Beresford Hope

Messrs Davy & Sons

Nov 12 1886

Mr Beresford Hope

presents his compliments

to Messrs Davy & encloses

the errata in his address

at the Institute — when

these are made it may

go to press — Mr B H

does not require

to see any

ON THE MEASUREMENT OF THE OBSTRUCTION OF ANCIENT LIGHTS:—FURTHER INVESTIGATION.

By William White, F.S.A., Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, November 19, 1866

When I attended the closing meeting of the last Session, prepared to offer a few remarks upon the "Obstruction of Ancient Lights," certain of my friends affected to suppose that I was about to speak of some of the living lights of Mediæval architecture, or at least of the obliteration or obscuration of their works. Others, more nearly interested in the matter, credited me with coming forward in a spirit of captious hostility to attack an original and useful treatment of a subject which our friend Professor Kerr had so cleverly worked out, and upon which, he alleged, a basis had been sufficiently agreed upon by certain members of the Profession to be recognized by courts of law, in respect of professional evidence as to fact, to be given through means of the measurement of the obstruction of established easements.

In taking up the thread of the argument woven by him, I have no intention of combating his scheme of measurement, though I may question details which seem to me to require further and very serious consideration. Whether or not he may be brought to see the necessity of modifying his formula, undoubtedly he deserves the credit of having, upon the whole, developed a more satisfactory and practical theory than some of our friends are ready to allow. Certain of his data, however, seem to me, as yet, so very far from satisfactory, that I cannot refrain from putting together the results of my own investigations, to share the fate whether of acceptance or of rejection, as the case may be, from those who shall be willing as well as able to accompany me through a now well-worn subject, dry perhaps in itself, yet suggestive of many interesting reflections in the way of scientific inquiry. And I can assure him I have no desire to intrude upon his field of labour with any view merely to raise doubts or to suggest difficulties. There are enough of these already in the pursuit of any such branch of professional practice. Nor is it a track which either my inclination or my connection will ever lead me to follow; and I am not likely to be brought much into collision, or into contact, either with the facts most prominent, or with the persons most interested in cases of damage, and claims for compensation. Yet it is one of the multitudinous branches of study which it is, at the least, becoming to each one of us to master, or to make himself more or less acquainted with, if he will take that comprehensive grasp of his profession which is necessary to a proper acquaintance with it, or to a full recognition of it. It was in this spirit and on this ground alone that I endeavoured to obtain an insight into it.

In my first attempts, I must confess, I was met with difficulties naturally incident to a new field of inquiry; and when I began to see through them I found conclusions drawn which I could not reconcile with what I knew, or thought I knew, to be fact,—conclusions manifest no doubt to their author, upon which final decisions were said to have been made, but which I could not accept without further demonstration,—conclusions affecting not the general principle involved in the mode of dealing with the subject, but only some very important data of compensation necessary in rating the process and establishing the standard to be based upon it. I may add, however, that knowing how apt one is to over-estimate the evidence of one's own conclusions, I endeavoured to fortify myself with a few other trustworthy opinions as to one of my objections—some gleaned from members of our own fraternity, but one especially from a lawyer of standing who has himself had to deal with cases of obstruction of light.

Having been told so plainly and so positively that reflected light could not be recognized as an element for legislation, I was anxious to know what might be the views of any authorities upon the rule laid down to as reflected light generally, and as to the simple proposition exhibited in plate I., fig. 1, in particular. This shews a wall, say, 46 feet distant and 52 feet high, obscuring the sky at an elevation of 45° from the centre of an ancient light. An intermediate wall is supposed to be built 20 feet away and 26 feet high, or 20 feet above the same horizontal line, and consequently at the same angle of elevation against the sky as the old wall. I began to speak of reflective power; and without obtaining even a side-glance at my diagram, I was simply told, and unhesitatingly, that no provision by which reflected light might be supposed to supply the place of direct day-light could be recognized as affording any mitigation of an obstruction. This, however, I knew perfectly well before, and it was not to my point. Upon pressing it further I was told, just as unhesitatingly, that the common sense of any Court must be unanimous as to the greater damage done by the greater nearness of an obstruction at the same angle against the sky, if it were properly laid before the Court, without even the necessity of reference to the scientific facts upon which it might be supposed to rest. Yet it is this latter element of reflection equally with the former, and apparently upon the very same grounds, which our friend ignores, not only in his own name but in the name of judge and jury and the whole paraphernalia of law and equity.

To do him justice, however, he does indirectly recognize it in page 52 of his book, where he says—"When the interception of sky surface reaches the full limit of the tables (that is, when there is no sky visible at all, a question of wall-thickness in a measure) the result is not darkness, but there is left only such light as may be reflected from surrounding walls;" and he adds—"a case of this kind would, of course, be very exceptional indeed; but there need be no real difficulty in dealing with it by special diagram, apart from the fact that, on the face of it, such a case would be one of so little light as to render diminution without injury impossible, and measurement therefore superfluous." Now, without entering upon the difficult problem of devising a diagram to shew "total obscuration," the fact of light admitted solely by reflection is recognized, even if not allowed as an element deserving scientific treatment; but it is only under circumstances of entire obscuration of sky surface that it is allowed, whilst I maintain that the element of reflection ought to be taken into account in all cases, and under all circumstances, next after the measurement of sky surface itself, and, of course, in proper connection with it.

If the conclusion at which my legal friend so unhesitatingly arrived is indeed of such a "common-sense" sort, it may be thought superfluous for me to follow it out in further detail. But I know there are some who will not so readily accept it as an evident conclusion, and it becomes necessary to enter more minutely into it; after which I shall have a few words to say upon the still dryer subject of "measures" of light.

My first impression, upon reading Professor Kerr's paper, was that the explanation even there was not simple enough. It might do for those who had the subject, as he had, at their finger's-end; but it was neither elementary enough for those approaching it like myself for the first time, nor yet full enough for those who wished to go thoroughly into it, and test the calculations for themselves; and hence probably the majority of members would simply accept his conclusions as correct, or else entirely ignore the investigation of them as of no interest to them. He acknowledged in that paper that his most scientific friends had advised him that his book was much less intelligible than he had supposed; and I felt assured that he would again bear with some of his more *un*scientific friends, equally interested in the result, if they failed to take in, quite so quickly as they ought, his more detailed explanation, and if his argument should, with their more limited knowledge of mathematics, or of optics, or of science generally, seem not so full or so clear to them as it did to himself. At first it seemed to me (what was expressed by many) that his diagrams were too complex for a first illustration. They might have been taken from a real case with which he had had to deal, but they contained so many walls—walls so hopelessly confusing each other in their new and old arrangements—that the example became ill suited for the illustration of a theory by no means simple at first sight. But, when I had mastered it, I found that it was admirably suited to the purpose of exhibiting the system pursued, although I have been unable to arrive at all the results set forth by him, as will appear presently. I have entered into minute details and fractional quantities only so far as is absolutely necessary; but I have given my calculations in decimals, as being fuller and more free than halves and quarters, since feet and inches would be inapplicable to the purpose. I have, moreover, reduced all my quantities as nearly as practicable to the same standard as Professor Kerr's, in order to afford as accurate a comparison as possible.

Then, again, the elliptical form of the lines of obstruction, when projected on the picture, was surely worthy of fuller explanation. I must say, indeed, that the explanation is, as matter of fact, involved rather than elucidated by his observation that "the practice of perspective drawing recognizes diminution by distance horizontally, but *not vertically*." For in horizontal diminution this elliptical form hardly presents a parallel to perspective treatment—arising, as it does, simply from the fact of its being the representation of straight lines intercepted by the circular lines of plan and section, these circular lines of interception being, as it were, in correspondence with the form of the hemisphere of sky against which the obstruction is to be projected. That such is the case becomes at once manifest from the correlative fact that an obstruction formed by a wall semicircular on plan, and at any elevation, assumes, from the station point of sight, the form of a straight line across the entire extent of the picture. Thus, if we project the portion of a semicircular wall at b e on plan (the distance S D being = s b and s e), this at the height of x being insersected at y would give f g on elevation; D y = b, f and e g giving their projected heights respectively. The absolute distances from the point of sight, S b and S e, being alike, the projected heights correspond, each of them being set up on the same perpendicular line D on section. Whereas in the case of a straight wall b a (the direction and height being the same as b e), making the distance S h = S a, the same height at Z being set up on h gives the intersection at w; and D w = e v shews the projected height; f v therefore is the line of obstruction in this case. On the other hand, it may be true to say that the absence of diminution "vertically" corresponds exactly with the *form* of the table. As to whether it exactly corresponds with its spirit, I will not venture to decide; but the "square projection" theoretically consists of a series of gores ranged side by side with interstices between them, whilst the obstruction projected thereon represents a plain unbroken surface, and the question might fairly be raised whether the obstruction is not in reality greater than appears on a reticulated background. And in any case the alleged parallel of perspective drawing will not apply; for all perspective, though in practice

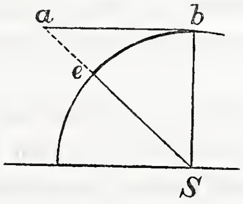


Fig. A.—Plan.

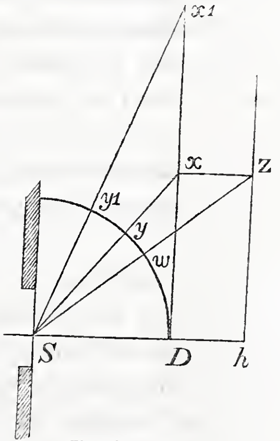


Fig. B.—Section.

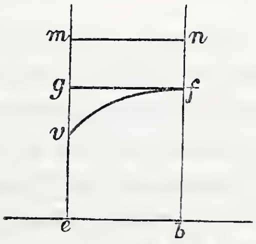


Fig. C.—Projected Elevation.

recognizing the non-diminution of the vertical lines, is theoretically curvilinear; and if truly carried out, the diminution *would* apply equally to the vertical no less than to the horizontal lines, the only difference being that in the horizontal lines the vanishing is so much more evident, in consequence of their naturally greater length, although in fact their length can rarely, even when properly, be great enough to require treating curvilineally; whereas in our present case the absence of diminution in the vertical lines arises only from the fact that this is but an elevation in vertical projection, and not in any sense a perspective.

Most of those that have cared to work out this manner of projection will probably have puzzled for some time over the diagrams. Then closing the book in despair they will have started afresh and found it a very simple matter after all. *Solvitur Ambulando:* and, when worked out, it will have been discovered that the rate of increase in the angle of obstruction of sky surface is very small in proportion as the wall rises, till the diminution becomes almost nominal, in proportion to the increased height. As, for example, the height of x on fig. B (page 19,) is 40 feet, whilst x 1 is another 40 feet. And whereas x (or y) covers 45° of the arc from the horizon, the next 40 feet (x 1) or y to y 1, covers but about 18°, and in the projected elevation gives m n as the line of obstruction, b m, e n, being = D to y 1; or taking it in another form, this is equal to a ratio of about 40 feet to 16 feet in apparent height. As regards the mere measurement of obstruction this makes no real difference; and of course it becomes a greater injury to take away one measure out of the remainder of 8; as *e. g.* are contained in the upper division of the quadrant or that called "vertical," than to take two measures or even 5 from the 45 of "vertical inclined;" and I call attention to it only that this small diminution of sky-surface to a rapid increase of height may be borne in mind, as it will be seen to affect very materially the question of reflected light.

We must now turn to the question of lighting power. I do not profess to have a knowledge of optics; and I cannot pretend to aim at technical accuracy in my explanations. I can only do my best, and my best I shall do, to render my meaning intelligible. And here it becomes necessary for me to define what I mean when I shall speak of "direct" light. I mean light coming directly from the surface of the sky, although, strictly speaking, this light is both reflected and diffused: for it is reflected immediately from the sun, lighting up the body of aqueous atmosphere which surrounds the earth. But it is also sufficiently powerful and *direct* to cast a direct shadow as distinct from a diffused shadow, or that especial shadow from diffused light to which I shall have occasion to refer presently.

Some of our friends suggested whether, for the measurement of this direct light, it would not have been more satisfactory to have taken a point inside the window instead of outside, and to have included, on the sky picture, only the sky surface visible from that point. Apart from reflection it certainly would give the truest measurement of the direct value of the sky surface; and as such it would be all the more removed from objection by way of argument on the score of the Professor's own tenet, that reflected light goes for little or nothing. It would be, moreover, the means of eliminating from our calculations just that portion of the sky surface with which we have in reality the least to do, and which, indeed, is already reduced to a very small, though not yet small enough, limit, by the method actually pursued. But it is from the whole body of exterior light that we must judge of what will find its way into the interior, whether by reflection or otherwise.

Then, again, there is the difficulty in any case of taking a single point to represent the whole of a window—a difficulty felt by many members in the course of the prolonged discussion upon Professor Kerr's paper. We must, of course, consider every other point equally throughout the opening as subject to the same analysis, though even here we are again at fault. For, for all purposes of common use requiring direct light rather than reflected light, that which is admitted through the lower part of the window, or near the floor, is comparatively valueless; and the higher in a room the direct light is admitted, the amount of light being equal, the better lighted will the room be, for all ordinary purposes. We must, however, content ourselves with taking that single point in the window which seems to secure the fairest average of the admission of the light.

Now it might seem that the ample treatment which this subject has received at Professor Kerr's hands would fully provide for every contingency which could arise, whether in the general principle or in the exceptional influences affecting it. I do not think so. It may be said that it is amply sufficient to guide a surveyor when he comes to take all the bearings of any ordinary case into consideration; and this may be pleaded especially as regards reflection, since reflection is supposed to be of no account with those who may have to interpret, or to carry out the law. Neither can I allow this to be the case.

It is certain that a reflecting surface upon your neighbour's property may in no case be pleaded by him as of positive legal value, or in any way as a diminution of the obstruction which he has raised. You could not maintain the right over his property which this would imply. Nor do I urge that the softening of distance by atmospheric perspective would be of any palpable moment in measuring the amount of an obstruction. It is in no way of the influence of a given surface from which any positive reflecting power may be obtained; but of the whole body of reflected light, or light diffused from reflection (as direct light is diffused from the sky), that I have to speak. The value of the direct light available through reflection is intercepted and diminished by the increased nearness or height of an obstruction—even where the actual measurement of sky surface obstructed in the case of height may be very nearly, and in the case of nearness exactly, the same. Indeed, the treatment of this subject is, as it seems to me, incomplete; and the inferences drawn from it are not to be depended upon without further inquiry into the nature and value of reflected light; or, still more, into the necessary connection of distance with reflection, and their respective bearings mutually upon each other, to which I shall return directly.

It was questioned, however, during the discussion on this paper that there might not be a mode of measuring by photography the relative amount of light in a room before, and after, obstruction. Whether this were done by means of test papers, by which the actinic force of light is measured to regulate the time of exposure, or by a picture of the room, this would be useless for the purpose—for the simple reason that the result would not be affected by the volume of light under the altered circumstances so much as by the chemical conditions of that light at the time of exposure. Photography might, however, be applied to test the actual encroachment upon sky surface at a given point immediately in front of a window, in some one given direction, but even this would not give a result so capable of measurement as that by diagram. Photography might also be applied to ascertain the relative *force* of obscuration between a distant and a nearer wall under the same conditions, and upon the same plane, or upon parallel planes: and I have reason to believe that if the relative absorption of light by the walls were measured in this way, the difference caused by distance would shew the effect, even of atmospheric perspective alone, to be greater than the learned Professor allows. This, however, we will suppose *to be of little or no consequence.* What I propose to shew is, that the difference caused by the mere close confinement of the space has a real and tangible effect. "But," I shall be asked, "what is this real and tangible effect as compared with the power of sky surface? It is sky surface that gives us light in our rooms, and what hair-splitting, what figment-painting it is, to argue as if light came not from heaven, but from earth!" Truly light does come from heaven, but for in-door use it comes to us through earthly objects; and I fearlessly assert that it is scarcely the direct light at all, but the reflected light that fills our rooms, under any of those circumstances of obscuration in which only a small portion of the room could by any possibility be reached by that direct light. It is, indeed, this process of reflection and counter-reflection, infinitely produced and reproduced from every point to every point, which fills our rooms,—and hence the importance of considering the fact of its admission as influenced by the comparative contraction or extension of the space receiving that direct light, and transmitting it through our window; the measure of sky surface supplying the window itself remaining the same. In fig. 1 you will see that from the opposite wall—the wall of the owner himself, marked O. H.—the obscuration of sky surface is so great as to throw the intermediate wall I. N. into comparative shadow, the whole of it, even to the very top, being obscured from the greater proportion of sky surface at an elevation of more than 50°, whilst the more distant wall Y. Z. receives all the light above the same angle, this light extending even below the horizontal line, and partly on to the ground line itself at *g*. In other words, the whole of the wall Y. Z. is in full light whilst the whole of the wall I. N. is in shadow,—of which, more presently,—and whatever may be the actual reflecting force of colour or surface of the two walls, supposing them, of course, to be alike, and whether this colour or surface is to be taken into the account or not, there can be no reasonable doubt whatever about the window light being affected very materially indeed by this shadow. Let us turn now for a few moments to consider more in detail the nature and action of reflected light.

The accumulative power of light, under its process of repeated reflection and counter-reflection, through an extended space, increases apparently in a direct ratio with the cube of that space, or with the square of the distance. I understand it to be a primary law in optics that every luminous point illumines in a direct line every other point within its range. This is without regard, of course, to the illuminative power of the point, or to the question whether the light is self-emittent or only reflected; and diffused light is no other than the emanation of such multitudinous rays from such multitudinous luminous points. It is the ray of light reflected from an object to the retina of the eye which makes the object visible, and it is the power of that ray which gives the measure of *reflective* power. Some persons seem to suppose that the actual amount of light finding its way to the ceiling, for instance, of an ordinary living room by means of mere reflection, must be but of very small account. Some can imagine only, as it were, an ocean of light filling the atmosphere, as air fills space, or as water fills the sea. They picture it to themselves as penetrating our rooms by a sort of pervading influence, apart from all reference, whether to reflection, or to that ceaseless motive connection with its source from which alone it derives its continuance. Light does indeed fill our atmosphere, and the incessant ripple of its silent waves penetrates the recesses of our habitations. But the operative force of these waves is said to be an active one, akin to the successively widening halo upon the face of the still waters, or to the repeated pulsation of sound which reverberates through the silent air. Light is said to be a force rather than a substance,—a motive principle, such as sound, or gravity, or electricity, rather than a passive substantial body, such as air, or gas, or water. And its operative power ceases only by its successive waves coming to rest when they meet with an absorbent, or when their channel of communication with the centre from which they emanated has been otherwise effectually cut off. They are driven hither and thither by opposing obstacles into infinite other courses, according to the inclination of the surfaces, or the nature of the atoms against which they strike. And the directions which light will take, according to the varying circumstances under which it is obstructed, have been accurately ascertained.

When we cast our eye over our ceilings we see that the lightest spot is that immediately above the windows, a spot which could be reached only by reflection,—reflection cast from the largest amount of external area within range of that spot. This spot, moreover, is ordinarily the lightest part of the room, next after the floor space beneath the window, or such other parts as may be illuminated directly by the sky surface. We might expect it to be the darkest, if we depended only, or mainly, upon the direct light. The darkest spot, however, is that on the upright wall over the window immediately beneath the ceiling, which, as will be seen, is the furthest removed from the influence of reflection,—from reflection even of this bright spot of ceiling; for the angle of incidence is such as to throw the light towards the useable part of the room, rather than backwards towards this upright part. Every ray which illumines an object in broad daylight comes directly either from the sun, or from the surface of the sky, or else from objects illumined by one of these. We receive rays of light from every conceivable object; but not from an atmosphere illumined by them, except in the case of what we call sky surface, or to a small extent in the case of a smoky or moist atmosphere. There would not be, for instance, a sufficient body of illumined atmosphere ordinarily between the street and the drawing-room ceiling to collect and reflect even a faint ray of light upon the ceiling. The few feet of atmosphere contained in that space, as compared with the 40 or 50 miles of atmosphere surrounding it, would be as nothing; and even if through fog or smoke the atmosphere is sufficiently dense to reflect light at all, this very denseness takes away more light than it contributes. In retiring from your window sufficiently far to be screened from the light of the sky surface, it is quite a mistake to suppose that that part of the room is lighted by ordinary daylight or atmospheric diffusion apart from such reflected points. And we may form some idea of the power and importance of reflection from the remarkable but no doubt familiar fact, that the shadow of a horse or carriage passing along the street, or even of a person along the pavement, is very plainly perceptible upon the ceiling and walls even of a tolerably well lighted room. This is plainly perceptible not only in a ground floor room, but even in the upper stories of a town house, and the broad dim shadow crossing the room, as the unconscious author of it outside passes along the dull grey pavement, presents a phenomenon well worthy of the attentive study of the surveyor of obstructions of lights. I must not omit to mention also the palpable difference in the force of this light and of images thrown upon it, when it comes within the range of a break in the buildings opening out a wider space of roadway and a greater distance of house-front, allowing of an extended surface, and thus of an increased power of reflection. I have myself seen on a grey sunless morning a gleam of light cast across a first-floor ceiling from a single chink in the nearly-closed shutters; I have seen the shadow of people passing outside thrown upon the ceiling thus illumined, with sufficient distinctness to distinguish clearly their head from their feet, and to detect even a bundle upon their back. And from whence was this reflected? It was from the sombre surface of a London street, illumined not by the sun, but solely by such diffused rays as reached it from the sky. It must be noticed too that the effect of this is not that of a common shadow cast from a direct light, and advancing *pari passû* with the intercepting object, and continuing its obstruction only just to the width of the window from one single point of radiation: but after the manner of all such shadows cast from diffused light through an opening, the shadow is reversed; the feet are towards the ceiling or the window; it approaches from the opposite direction to its object; it is visible during the whole time even of oblique proximity; and its nature appears to be similar to that of a shadow cast through the lens of a camera, not that of a direct shadow. Thus in fig. 1 the shadow is cast from *f* to *f* 1, from *h* to *h* 1, from *k* to *k* 1, and from *n* to *n* 1. I will not pause to explain the action of this: nor is it to the shadow itself that I wish to call your attention, but only to the substantial fact of the power of that merely reflective light which casts it, and to the injury necessarily done to the lighting of a room by any diminution of that light.

Having now considered the nature of reflected light, we must examine some of its ordinary results as bearing on our subject. Even a van or a carriage, standing 12 or 15 feet from our window, in a street 50 feet wide, and obstructing no sky surface beyond what is already fully obstructed by the houses opposite, will make an obstruction for the time sufficient to affect visibly the value of the light within the room, and to enshroud the ceiling itself in gloom. (See fig. 1.) The reflecting surface is not only contracted but darkened by the van. The wall from Z to X, which is in tolerably full light, is intercepted, as also is the ground surface from Z to *v*, and you will see where the darkening obstruction strikes the ceiling and the walls from these points. Now this supposed room is 20 feet × 15 wide. The windows are obstructed at an elevation of 45° from the centre of the window. It is a room well lighted for ordinary purposes according to the proportion of 68 measures to 6 feet of window width. Now how much of this room is lighted by direct light? Let us see.

Paterfamilias (P. F. on section) reflecting upon the dulness of his morning's "Times," stands within two feet or so of one of the windows in order to obtain as much direct light upon his subject as he can, and be it observed he is here at the extreme limit of the direct light. The rising generation (R. G.) sit at the table, reflecting upon the difficulties of taking in knowledge and instruction, but failing to catch a single gleam of this direct light. For this light is cast scarcely at all beyond the station which Paterfamilias has chosen, and then chiefly upon the floor. It extends only just to the edge of the table. What then becomes of all the rest of the room? A tenth or at most an eighth part of the cubical space in the room is well lighted by direct light, but what becomes of the remaining $\frac{7}{8}$ or $\frac{9}{10}$ beyond the angle *b a*? That space is lighted absolutely and positively by reflected light, and by nothing else,—not solely or even mainly reflected from the direct light which has found its way to the floor—but from innumerable illumined points or surfaces outside as well as in, the inside surface forming but an inappreciable portion of the whole. In proof of this last position I have only to point out that the lightest part extends only from *q* 1 to *m* 1, whilst the space from *m* 1 to the wall is in strong shadow; and, as in the case of an illustration to which I shall refer presently, it is the spaces immediately surrounding the windows which derive all the benefit of the direct light—whilst it is the *interior parts of the room* which are affected chiefly by the contraction of reflecting space outside.

Let us now take any points P, *q*, *r*, S and X as representing reflecting surfaces lighted by direct light, though partly by reflection also; P will reflect light to the space between *p* 1 and *p* 2, *q* between *q* 1 and *q* 2, X between *x* 1 and *x* 2, and so on, *ad infinitum*. In order, therefore, that they may reflect an effectual amount of light, it is of consequence that these points should be well lighted. Now supposing the intercepting wall I N to be carried up, P is lighted by about 30° of sky surface, *q* by 20°, and *r* by 25°, as against P 45°, X 50°, and S 85°, the corresponding points to P, *q* and *r* under the original state of things; the degrees of light being represented by the angles H P N, H *q* N, H *r* N, as against H P S, H X S, H S Y. Thus not only did P, X and S contribute more than two-and-a-half times the amount of illuminative *power* for purposes of reflection, but also three times the amount of reflecting *surface*, or the advantage of 7 to 1 so far as reflection is concerned. This, then, sufficiently proves my proposition, but in further confirmation of its practical result, I have made a careful diagram of a case which, according to Professor Kerr's formula, might be well lighted; for it enjoys 78 or 79 of his measures of light, in the proportion of 50 feet area to 3 feet of window width, instead of 68; whereas the light is very insufficient. There is ample light just round the windows, but the remainder of the room is gloomy, except in very light weather. And this is attributable mainly, as I believe, to the great nearness of the obstruction. The standard given by him is that of a gentleman's ordinary dining room in a London house. We may suppose the street to be at the least 50 feet wide; whereas in the case before me it is but 25 feet. My illustration is that of the coffee room of the King's Arms at Lancaster, to the obliging landlord of which celebrated house I am indebted for facilities in obtaining my measurements.

There is space for no proper accumulation of reflective rays, and consequently the street itself is in comparative gloom. The windows together measure 8 feet 6 inches. The room is about 28-6 × 15 = 425 feet area, and 425 feet ÷ 50 = 8½ feet window width.

	feet.	inches.
The height of the room is	9	6
Deduct 1 foot below ceiling + 2 feet 6 below window	3	6
Height of window required . . .	6	0

But owing to a Venetian blind it is only 5 feet 2. If a height of 6 feet requires 68 measures, 5 feet 2 will require 78½ measures of light. Instead of this we have but a gloomy room with 91 measures—or 15 per cent. more than the requisite standard.

How to reduce the influence of reflection to a positive quantity may or may not be capable of solution. Perhaps we might reckon that where the reflective power has been reduced by 7 to 1, we might reckon 7 measures to be the result of positive abstraction of light. But I will not venture an opinion as to this. And Professor Kerr's own illustration, as given in his lecture, is surely a case in point. Upon the face of it one would have said, from the diagram, there was a case of substantial injury to the easement. This, however, he has shewn by measurement to be a mistake; I shall refer further on to the question of measurement; but now let us look at the old wall *b. j.* on his plan. It was 20 feet high, and it is raised to 40 feet. This must surely take away from the yard C a very considerable portion of the light which it used to reflect, as well as from the walls adjoining. But besides this there is a wall, *a. f.*, built close to the easement. Is it possible to suppose that no shadow is cast from this upon the wall immediately adjoining? I mean the wall in which the easement is. And again, is the whole space of ground from *j.* to *k.* as well lighted as if the wall *a. f.* were away? And the same may be asked of the walls *e* and *d*, with regard to the yard between them, and the walls which are mutually darkened by each other by the carrying up of a new wall 6 feet nearer than the old, and 30 feet higher. I wonder if these premises were inspected by anyone to give evidence —apart from measurement—before as well as after the re-modelling of the building. Surely there must have been a growing sense of confinement and gloom to the inmates as those several walls were carried up. At the least, 8 or 10 measures of light might be reckoned as swallowed up and counteracted by them. This, added to the measure of obstruction, would have given a total of 15 measures obstructed beyond necessary lighting,—or about 16 per cent. of the original,—a case for compensation, according to his own data; and doubtless, if this had been properly represented in any Court, compensation would have been granted. If the owner, however, is well satisfied, it might be cruel to disturb his contentment—"Where ignorance is bliss, 'tis folly to be wise."

Another question, too, suggests itself—whether the calculation of 3 feet of window width for 50 feet superficial of floor is properly enough for a window so close to the corner of a room, but more especially when a side wall is built up within 2 feet of it, casting its forbidding shadow right into the main part of the room? Surely, if a case of this sort is given for the sake of an illustration of what is *not* a case for substantial damages, attention ought to be called to any extenuating influences which may be supposed to counteract the inevitable consequences of such obstructions.

The matter of Reflection, however, important as it is, as affecting the general result, is of very small consequence compared with the question of the measure of lighting power and sky surface, to which we must now turn our attention.

It might seem a very simple matter to work out the several problems contained in the basis of the calculations laid down by Professor Kerr, but it is not so. Possibly a somewhat fuller account on his part, of the manner in which he worked his figures, might have enabled an independent inquirer to arrive at a conclusion not so widely different from his own. He may remember that, at the discussion upon his paper, I "thought that the paper might have been accompanied by one or two slight woodcuts, just sufficient to show the manner in which the several parts were to be connected and referenced, and also the manner in which he determined the relative value of the several measures, and the reduction of the spherical segments." He seemed to think, however, that any such explanation would be quite superfluous, and that his book, as explained by his paper, placed the matter within the scope of the meanest capacity. I had looked into the subject, but I had not at that time worked it out for myself. I have now endeavoured to supply that deficiency, and having worked back from the results given by him, I cannot discover that the true ratio of the quantity of available light admitted through a window agrees with his tables; nor yet that the comparative value metrically of the divisions of sky surface is pursuant to what I understand of his method of dealing with it.

I shall not tax my own time or yours by entering upon the question of "necessary" lighting. I accept his standard of "an angle of 45° to the entire length of the opposite street," as a minimum,—which he computes at 68 measures,—I shall merely observe in passing that since this minimum has been laid down by others at 50 per cent. more than this, there will be still room for the widest possible difference of opinion, even after the most accurate reduction of the general formula. And we ought to be careful of making this minimum too small,—for the smaller it is made, the greater will be the damage in proportion to the measurement of obstruction.

And first, we must turn to the quantity of available light admitted through a window,—*e. g.*, as he himself says, through a window of ordinary width in proportion to thickness of wall. Now he makes this ratio 61·58·52·18. He does not say what is the width of window, or thickness of wall, upon which his calculation is based. His diagram seems perfectly intelligible, but I cannot make out under *any* circumstances, even in the case of a wall of *no thickness*, or say of the finest sheet iron, a ratio in which the light of the sections called "Side Inclined" and "Vertical Inclined" can come to more than 47·3 (instead of 52) upon the 61. With an opening of 4 feet, and a wall 9 inches thick, (the minimum that reasonably could be taken) it works out at 44, and with an 18-inch wall, 38·6; and similarly with the other divisions. His scale tabulated is as No. 1; whilst my tables are as follows:—With no thickness of wall, as No. 1.A.; with a 9-inch wall, as No. 1.B.; with an 18-inch wall, as No. 1.C.,—the opening, in each case (see figs. on plate), being 4 feet wide—

No. 1.	No. 1.A.	No. 1.B.	No. 1.C.
61	61	61	61
58	56·2	54·4	53·2
52	47·3	44	38·6
18	33·6	19·2	8·9

The figures below the line are kept thus separate only as indicating the far greater diminution caused by thickness of wall in the sections called "Side" and "Vertical." I cannot see how a different result is obtainable. I have worked it out several times, in different ways, but always with the same result. But possibly in making the calculations some little modification was necessary which ought to have been evident to my own common-sense, or which deserved some further explanation from him. But I prepared my diagrams to a large scale in order to be able to ensure tolerable accuracy.

In computing the relative value by measure of the several compartments of sky surface for the "accepted divisions," our discrepancy is still greater. The Professor certainly leads us to suppose

OBSTRUCTIONS OF WINDOW LIGHTING.

Further Investigation by

WILLIAM WHITE, F. S. A. FELLOW.

Figure 1. DIAGRAM SHEWING THE EFFECTS OF REFLECTION.

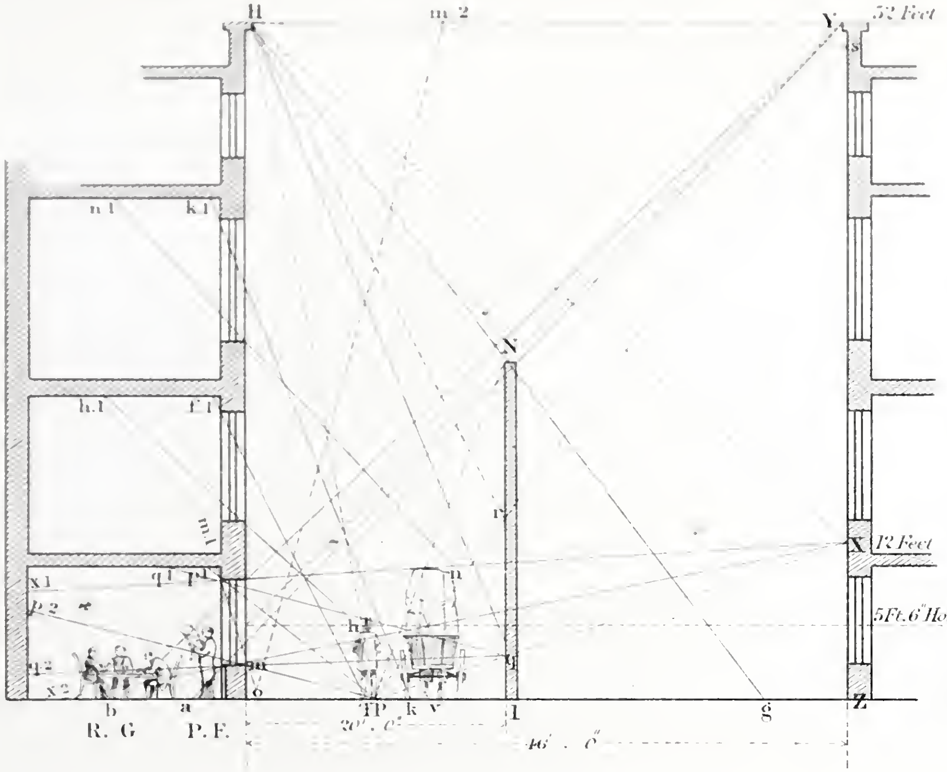


Figure 5.

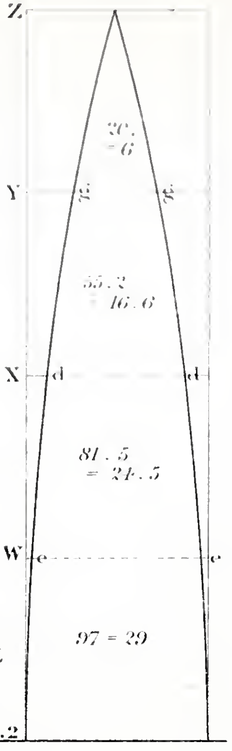


Figure 4.

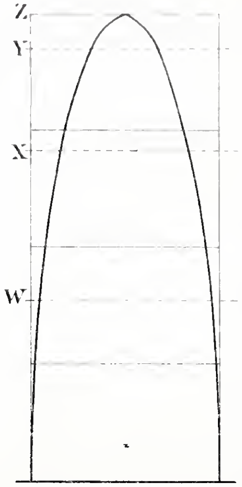


Figure 3. SHEWING SPHERE IN PLAN.

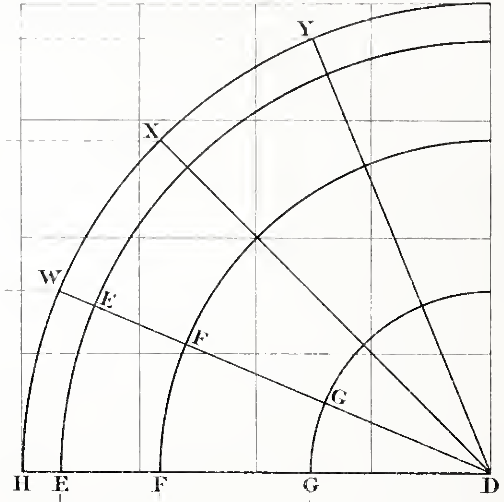


Figure 2. SHEWING AN AMENDED RESULT.

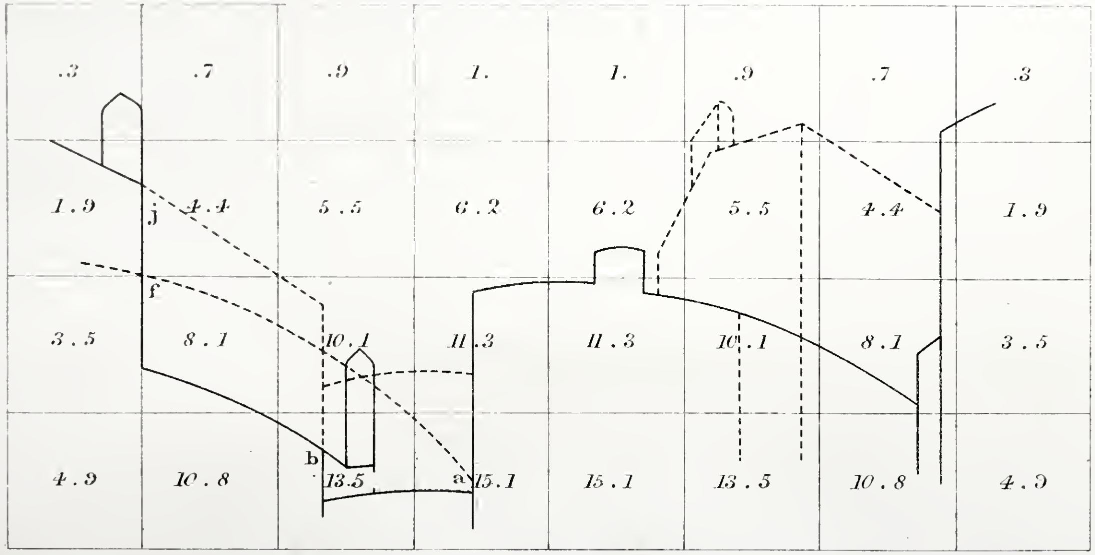


Figure 7.

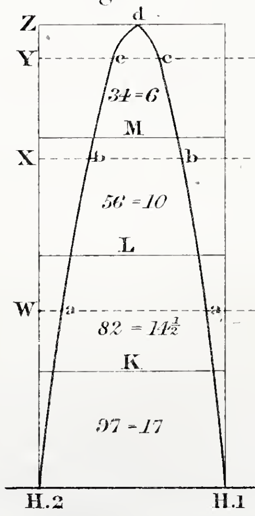


Figure 6. SHEWING CIRCULAR PROJECTION.

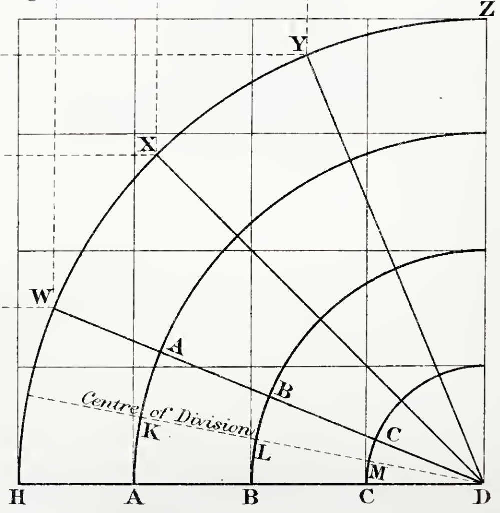


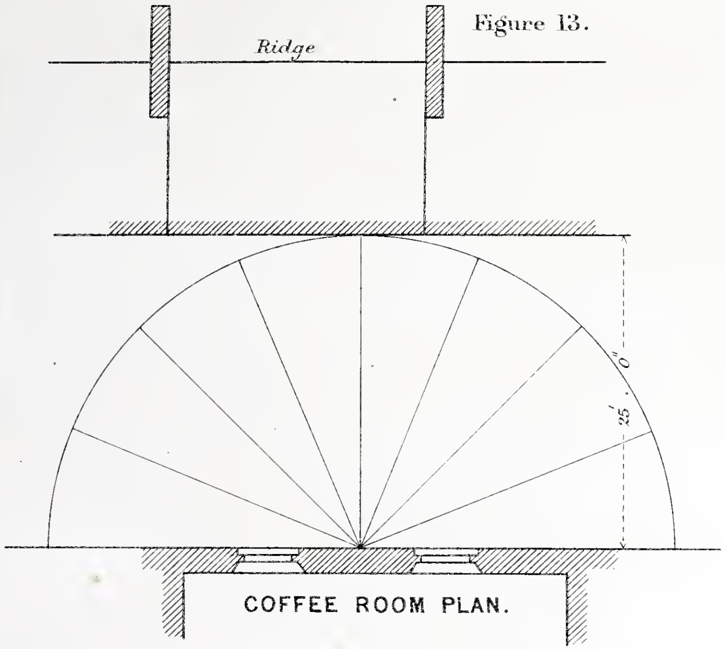
Plate II.

OBSTRUCTIONS OF WINDOW LIGHTING.

Further Investigation by

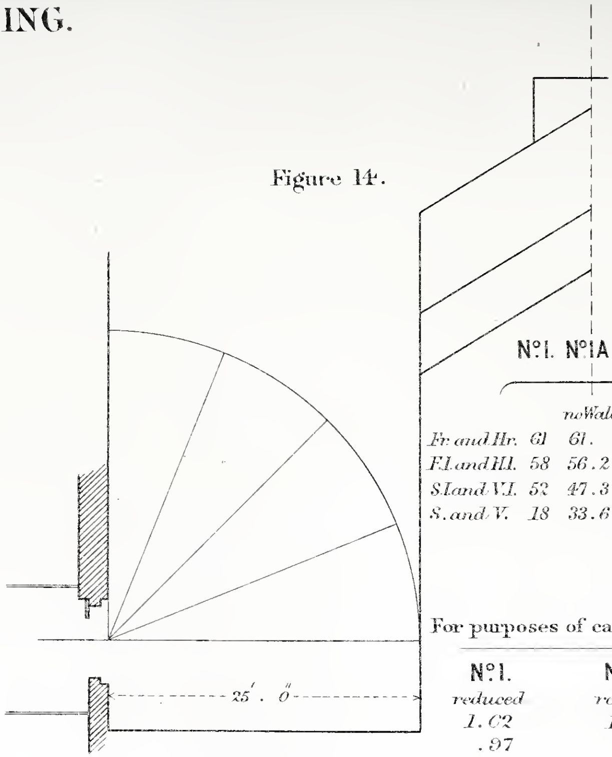
WILLIAM WHITE, F. S. A. FELLOW.

Figure 13.



COFFEE ROOM PLAN.

Figure 14.



SECTION.

	N°. I.	N°. I A.	N°. I B.	N°. I C.
		no Wall	9" Wall	18" Wall
Fr. and Hr.	61	61.	61.	61.
F.I. and H.I.	58	56.2	54.4	53.2
S.I. and V.I.	52	47.3	44.4	38.6
S. and V.	18	33.6	19.2	8.9

For purposes of calculation.

N°. I. reduced	N°. I B. reduced
1.02	1.02
.97	.91
.87	.73
.30	.32

Figure 9. N°. I A.

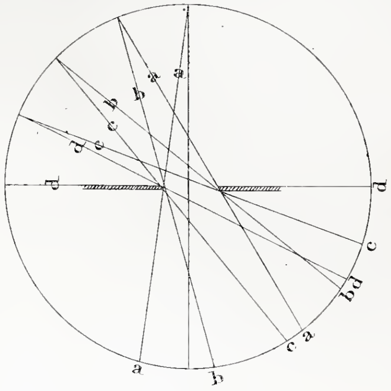


Figure 10. N°. I B.

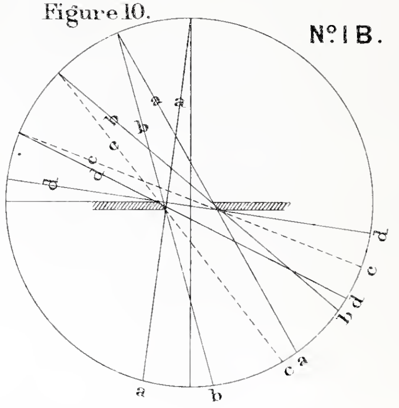
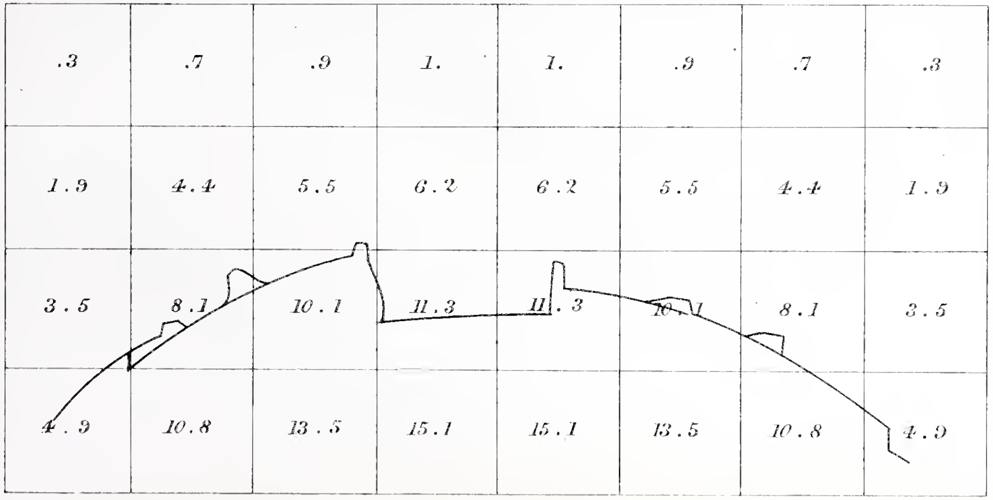
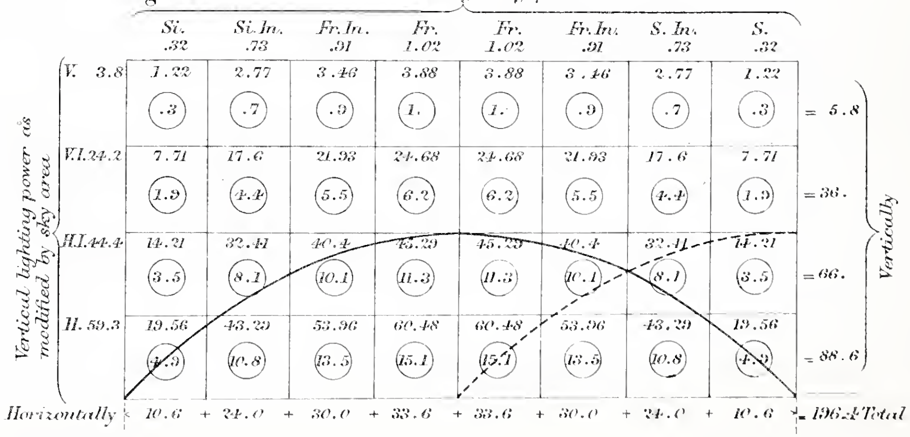


Figure 12. PROJECTION IN FRONT OF WINDOWS.



.3	.7	.9	1.	1.	.9	.7	.3
1.9	4.4	5.5	6.2	6.2	5.5	4.4	1.9
3.5	8.1	10.1	11.3	11.3	10.1	8.1	3.5
4.9	10.8	13.5	15.1	15.1	13.5	10.8	4.9

Figure 11. *Horizontal lighting power.*



Vertical lighting power as modified by sky area

	Si. .32	*Si. In.* .73	*Fr. In.* .91	*Fr.* 1.02	*Fr.* 1.02	*Fr. In.* .91	*S. In.* .73	*S.* .32	*Vertically*
V. 3.8	1.22 (.3)	2.77 (.7)	3.46 (.9)	3.88 (1.)	3.88 (1.)	3.46 (.9)	2.77 (.7)	1.22 (.3)	= 5.8
V.I. 24.2	7.71 (1.9)	17.6 (4.4)	21.93 (5.5)	24.68 (6.2)	24.68 (6.2)	21.93 (5.5)	17.6 (4.4)	7.71 (1.9)	= 36.
H.I. 44.4	14.21 (3.5)	32.41 (8.1)	40.4 (10.1)	45.29 (11.3)	45.29 (11.3)	40.4 (10.1)	32.41 (8.1)	14.21 (3.5)	= 66.
H. 59.3	19.56 (4.9)	43.29 (10.8)	53.96 (13.5)	60.48 (15.1)	60.48 (15.1)	53.96 (13.5)	43.29 (10.8)	19.56 (4.9)	= 88.6
Horizontally	10.6 +	24.0 +	30.0 +	33.6 +	33.6 +	30.0 +	24.0 +	10.6	= 196.4 *Total*

that he follows out the same system as that described in the projection of obstructions,—treating the sky as a perfect hemisphere of which every portion of surface is to be as accurately mapped out and measured as if it were indeed the surface of a perfect miniature sphere spread out in sections upon the paper.

This seems to me, likewise, the only true and proper way of dealing with it. In reducing this to a simple geometrical process for ascertaining the relative areas of the several vertical compartments respectively, we must take the following diagrams :—

We must suppose fig. 6 to represent the quadrant divided from horizon to zenith, H to Z, into four equal parts at W X Y. Fig. 3 shows the same in plan, the lines of latitude, so to say, drawn from E F G, corresponding, as shown by the dotted lines from fig. 6, with X Y Z. From these divisions, H W X Y Z, on fig 6, we set up the heights W X Y Z on fig. 5. We then make *e e* on fig. 5 = E E on fig. 3, and so with the others. This gives us the outline of one of these segments, from which to measure the actual area, very nearly.

The relative areas of these compartments, thus divided into equal heights, came, as accurately as I could measure them, to 97, 81·5, 55·2, 20. I have found subsequently (too late to revise my calculations) that this is not strictly accurate. The discrepancy, however, is very small—measurement by trigonometry giving 3·827, 3·244, 2·168, 0·761, or 97, 82·2, 55, 19·3, very nearly. Whereas Professor Kerr's ratio appears to work out at 97, 82, 56, 34; the last quantity of 34 being nearly 75 per cent. greater than it ought to be, according to my judgment.

But he neither gives us the ratio nor tells us the process by which he arrives at it. He does give us a clue to it in the dotted line of the diagram, and he gives us a subsequent result with which this pretty accurately corresponds. But concerning this result he merely makes the assertion that, after the requisite reduction, "*it will be found* the 'horizontal' division is 59, 'Hor. In.' 47½, 'Ver. In.' 29½, and 'Ver.' 6." From this, however, we can gather that his computation of the relative *size* of the areas is as I have stated it; for if we multiply his table of lighting power into the ratio which I assume as his, we arrive at this result :—

$$
\begin{aligned}
\cdot 97 \times 61 &= 59 \\
\cdot 82 \times 58 &= 47\tfrac{1}{2} \\
\cdot 56 \times 53 &= 29\tfrac{1}{2} \\
\cdot 34 \times 18 &= 6
\end{aligned}
$$

This ratio of 97 · 82 · 56 · 34, coinciding as it does with the form of the dotted line, gives a clue, but only a clue, to the exact outline to the form given. How this ratio was determined in the first instance, or how the dotted line came to take this form, is a matter demanding further explanation. It does indeed coincide accurately—not to say curiously—with an impracticable projection of a division of the hemisphere, just sufficiently suggested by the diagram to have been originated by mere oversight. I have given this together with the other projections on Plates I. and II., not as supposing it for a moment to have been really followed, but only as affording a comparison, by Diagram, of the actual difference in ratio between us. Fig. 7, then, shows the projection referred to. It is supposed to represent one divisions H D W of the "circular projection" given on fig. 6. H W X Y Z represent four equal divisions of circumference in vertical section, and H_2 W X Y Z on fig. 7 are the projected heights corresponding therewith. By A. B. C. are shown equal divisions of radius, or base line, on *plan.* From the intersection of these lines, we make the width $H_1 H_2$. = H.W.; and we make *a. a.* = A A.; *b. b.* = B B; *c. c.* = C C, at their respective heights W. X. Y. It is plain that if W. X. Y. represent equal divisions on the circumference, A. B. C. represent equal divisions on the radius; and hence, supposing our lines on plan and section to represent divisions of a sphere in which we have to do only with the circumference, these lines have in reality no connection with each other. They would not intersect on the same plane. And then again, in order to arrive at a more equable division vertically, than W. X. Y. would give, it becomes needful to divide this unequally projected figure into four equal heights at K. L. M. on fig. 7, corresponding with K. L. M. on fig. 6, before valuing their ratio. Obviously, therefore, this could not have been the plan pursued, and unless there is some error in the arithmetical calculations I can only suppose his diminishing segment to have been roughly sketched out by hand, without due thought as to the extent of the consequences involved. But I may yet learn that it was elaborated from a process which I have been unable to penetrate, but which, after all, may prove to be sound and true. The ratio, again, of this unreal projection hits a sort of mean between two true but inapplicable methods of projecting a section of the hemisphere for this purpose. The first is that of treating the sky somewhat as a vast plane parallel with the horizon, as shown by fig. 6, considered as plan only—not as before, plan and section. The sphere is here simply projected on to the horizontal plane divided into four parts by parallel equidistant lines. The other gives a projection upon the perpendicular to the horizon as on fig. 4. This would be too much like treating the sky as a vast plane perpendicular to the horizon.

It was maintained by Mr. Richard Bell that the sky ought to be treated as a plane, not as a sphere. I will not venture upon an opinion as to this. I will say, however, that if treated as a sphere, the method pursued must be that which I have pointed out; but I think the difficulties of treating it as a plane would be found to be considerable.

Then, again, I am equally at a loss to make the reduction of lighting power for skylights agree with the formula. For, taking the standard as before of lighting power at 61·58·53·18, it ought to be—

$$\begin{aligned} 18 \times 3{\cdot}827 &= 17 \\ 53 \times 3{\cdot}244 &= 44 \\ 58 \times 2{\cdot}168 &= 33 \\ 61 \times {\cdot}827 &= 12 \end{aligned}$$

But this is not so wide of the result which Professor Kerr gives: viz., 17, 42½, 31, 11; whereas if it were reduced as before by what was supposed by me to be his ratio—97, 82, 56, 34, it would work out at 17, 42·4, 31·7, 20·2. But I have not gone into this further.

It might seem that a difference of the sort to which I have called attention, only in the margin of the picture, would make but little real difference in the result, seeing that we have but to obtain the proportionate obstruction of a surface upon it, whatever its conventional value may be. But when this is further modified by the other difference between us, the tables are quite turned, and the illustration given by Professor Kerr, to shew that no real damage is done to a certain easement by certain new buildings erected, the diminution being only 5¾ measures beyond the "necessary lighting," is converted into a substantial case for compensation, according to my data. Apart from the influence of nearness upon the reflective power of light already referred to, there is a further diminution actually of 24 measures beyond the necessary lighting, or 30 per cent. upon the original light enjoyed, or two-fifths of the necessary lighting value.

Let us turn now to fig. 2 on plate I., shewing this amended result. We collect first the lighting formerly enjoyed:—

$$\begin{aligned} .2 + .7. + .9 + 1. + 1. + .9 + .7 + .2 &= 5.6 \\ .1 + 4.4 + 5.5 + 6.1 + 5.6 + 5.5 + 4. + 0 &= 31.2 \\ .0 + 6.5 + 9.0 + 5.0 + .8 + 4.0 + 4. + 0 &= 29.3 \\ 3. + 4. &= 7. \end{aligned}$$

Formerly enjoyed ... 73.1 measures.

Intercepted by new buildings—

$$\begin{array}{rl} .3. & = \ \ .3 \\ 1 - 5 + 0 \ \ + 0 \ \ + 5 + 5.3 + 3.6 & = 10.9 \\ 5. \ \ 5 + 4.5 + 1.5 + 4 + 4. + 4 & = 19.9 \\ 3. + 4 & = \ \ 7. \\ \hline \end{array}$$

Intercepted by new buildings ... 38.1 measures.

But we must next see what is our minimum of "necessary" lighting, viz. with the opposite houses cutting the sky all along the front at an angle of 45°. This, as indicated by the curved line on fig. 11, plate II, will be 73 measures instead of the 68 by Professor Kerr's formula. Now, to follow out the process, we have the floor space of room 10 feet × 12 feet = 120 feet. This, with the minimum 73 measures of light, will require $\frac{120}{50} = 2\frac{2}{5}$ feet of window-width. But the window-width in reality is 3 feet, which would require $73 \times 2\frac{2}{5} \div 3 = 58\frac{1}{3}$ measures of "necessary" lighting; so that the former lighting of 73 measures was enough and to spare by so much as it exceeds the $58\frac{1}{3}$ measures of necessary lighting. Therefore there is spare lighting of $73 - 58\frac{1}{3} = 14\frac{2}{3}$ measures. We have seen that the diminution of lighting is 38 measures. Now $38 - 14\frac{2}{3}$ excess $= 23\frac{1}{3}$ measures of light taken away beyond the minimum required. This is equal to nearly one-third, or just 30 per cent., of the original 73 measures. Would this, then, be a "material" damage? I think it would. Professor Kerr considers that only $6\frac{1}{2}$ per cent. is the actual diminution.

If a difference of opinion professedly based upon scientific measurement alone can exist to such an extent as this, the difference between $6\frac{1}{2}$ per cent. and 30 per cent. of diminution upon the original lighting enjoyed—a difference of nearly five times the amount of damage done—not only when we appear as experts shall we be laughed out of Court as inexperts by our legal friends, but a fresh impetus will be given to the old system of individual rather than of professional opinion, upon a matter which undoubtedly ought to be, to a very great extent, capable of scientific test.

This too is irrespective of intercepted reflection, and of the still disputed question, not touched upon here, of window area required in proportion to the size of the room, which alone might make a further difference of 15 measures, merely by taking 40 feet of area instead of 50 feet to be lighted by 3 feet of window-width. But, as I observed before, my own data were not perfectly accurate. The difference made by this would be as follows:—

Formerly enjoyed 70 measures. Intercepted by new buildings 38 measures. $70 \times 2\frac{2}{5} \div 3 = 56$ measures. Then $70 - 56 = 14$ measures of superfluity; and $38 - 14 = 24$ measures of actual damage, instead of $23\frac{1}{3}$ as I reckoned.

This then is a case surely of substantial injury and of substantial injustice too, if, as I gather, a claim was not raised merely on account of the alleged result of scientific measurement. I am content to leave my case in the hands of gentlemen of the jury to say if mine is not a *bonâ fide* case, and one requiring instant redress. At the same time, I would not presume to assert that Professor Kerr's mode of obtaining his data is not more correct, practically, than that which I have submitted to this meeting. I only maintain that it demands further proof and further explanation. He has brought considerable experience to bear, in combination with theory, upon the calculation of those data, and I do not suppose that theory, without great practical skill and experience, will ever be enough for the guidance of the surveyor. But so long as there is room for such serious doubts as to the proper mode of applying the principles, and as to the truth of the results, when worked out by two independent persons—even with the scrupulous and laborious, and for myself I may add, with anxious, care—it surely is a case not for hasty decision, but for searching inquiry.

I may be met, perhaps, with the plea that the room in question is even now well lighted, notwithstanding the new obstructions, and in spite of the observations I have made upon them; and that it is itself a standing and practical witness to the truth and correctness of the Professor's formula. I do not anticipate such a plea being made; and even if it were made in face of the foregoing facts, it might tend rather to condemn than to prove the theory. Whereas I myself believe the Professor's invention to be capable of useful and practical application when its discrepancies shall have been adjusted, and its data reduced to a more trustworthy and consistent standard. If there has been any oversight, it is a matter capable of correction for future cases; but unless I am grievously mistaken, which is equally possible, irreparable injustice will have been already done to a number of poor complainants who have suffered loss of light during the last twelve months, and whose causes have been advocated by an appeal to this standard.

The difficulty now suggests itself as to how these differences of computation are to be decided and adjusted. There is room at present, as I have shewn, for enough doubt upon it to leave the fact of obstruction, as a question of evidence, almost as much a matter of mere opinion as before. Without detracting in the slightest degree from the merit attached to the very original idea of measuring the sky surface, or to the ingenious and elaborate manner in which the sky surface and its obstructions have been measured, by the simplest geometry and arithmetic, I may perhaps be permitted to express a hope that the matter may receive such further elucidation as may remove this doubt. It is proverbially "easy enough for any fool to find fault," but it is not so easy to rebuild that which mere wantonness has destroyed. Perhaps I shall be called one of those troublesome busy spirits, born to labour under a vain attempt to set others right, regardless of their own frailty. However this may be, I cannot plead guilty to mere wantonness in calling attention to these evident and very grave defects, as needing further investigation before the system shall be finally laid on the shelf—whether as an accepted scientific fact, to be constantly referred to in future cases of encroachment; or as one of those ephemeral flights of genius, which failed only because man fails to touch the sky.

One other point I must briefly refer to as materially affecting the merits of the question. The proportionate power of lighting at the zenith has been dismissed as one of very small moment by Professor Kerr. I am ready to acquiesce entirely in his passing it over as a matter not to be taken into account in the scheme of measurement; but my acquiescence arises from grounds so widely different from his, that in case of the question being incidentally raised, it ought not to be altogether ignored. Moreover, in the obstruction of horizontal lights, a difference might well be made on this account in determining the data of calculation. The power of light at the zenith, in our latitudes, is materially greater than that at the horizon—apart, of course, from proximity to the direct light of the sun. When first I began to learn a little water-colour drawing, I innocently, and perhaps naturally, supposed that there was no difference between them. A little instruction and reflection, of course, opened my eyes to the true state of the case; but probably the "reason why" is not so much regarded as the fact itself. It appears to arise partly from the sky *not* being to us a perfect hemisphere, whatever may be its appearance. The sky is in a manner presented to us through the segment of the stratum of atmosphere, which is of the depth of 50 miles, more or less; and the chord of this segment forming, not a diameter of the earth, but a tangent of the earth's circumference, is very many times as great as its perpendicular, as was pointed out by Mr. Morris. It arises partly too from the interception of the sun's rays, by their having a passage through this greater distance of oblique section.

At twilight and at dawn, in our latitudes, the sun contributes his light to the earth reflected through the atmosphere almost solely from the zenith; and, as he mounts the sky, although we receive more and more of his direct rays, yet his power in them is still attempered by their oblique passage through the atmosphere, and the atmosphere still reflects his rays. At the tropics the rays of the sun are received more vertically; consequently atmospheric reflection is at a minimum. The sky becomes black rather than blue, and objects might almost be seen thousands of miles away unaffected by matospheric perspective.

From this cause arises that absence of twilight and dawn in tropical latitudes, and that rapid and almost sudden appearance and disappearance of the rising and setting sun. From hence also is it that, in latitudes approaching the tropics, the sun casts that sharp dark shadow which is said to have given rise to the fine, delicate lines of the sculpture and mouldings which prevailed in Classic Architecture in its highest development, as also to the minuteness of Oriental ornament, as compared with the more bold and severe forms which obtained in the zenith of England's Architecture, as of other Architecture in this part of the temperate zone, in Mediæval times.

I might be ready to allow that this greater lighting power at the zenith would compensate for the difference between us, in the computation of the area of sky surface, were it not that it is counteracted, and more than compensated for, by other considerations. Apart from the small proportion of direct light from the zenith which can possibly find its way in through a vertical window as already shown, there is an equally small amount of direct actual reflection from this angle of inclination. This reflection is, it is true, greater in force and value; which may partly, perhaps, account for the increased brightness, before referred to, of the light on the ceiling as it approaches the window; but this part is of very limited extent, and the shadow increases and spreads as it recedes from the immediate angle of direct reflection (see angle *m* 2, 0, *m* 1, fig. 1), and hence we derive light here less from the greater power than from the space which we may be able to obtain by an extended reflecting area. And I refer to it at all only as an additional illustration of the great delicacy of the machinery required for the proposed object of measuring with sufficient accuracy the surface of the sky.

It is not for me to enter into the legal question respecting obstruction, yet, so much having been said, I must add that if the law is so entirely satisfactory as it is alleged to be, and if the mode of adjudicating claims is generally accepted by those who may have to adjudicate, there seems nothing left to be desired. At the same I do not see why the defendant, who is proceeded against for an obstruction, should be more deserving of consideration than the complainant whose window light is injured. Nor can I see, if he *has* a right to light in his wall, the justice of forbidding the plaintiff to enlarge the easements injured as a matter of positive right rather than of arrangement—when he has been deprived of some of his light—supposing him then not to have enough left even for exceptional purposes. I would have the law to allow, rather than to forbid, the enlargement of the window which has suffered from obstruction. Nor do I see why the complainant should lose his title to a sufficient amount of light, upon its being proved that his warehouse had been turned into a lumber room for three years out of twenty—during which three years the shutters were not opened, and the glass was covered with cobweb and dirt. And again, as in the case of *Mason* v. *Read*, it appears to me that the fact of the very great enlargement of the window had already shown that the minimum of lighting power to a given area required very considerable enlargement, even in ordinary cases. It would be curious to inquire, apart from this, what *proof* would show, by the light which I have thrown upon it.

Of course no law can be made so perfect as to allow of no injustice being done, and I have understood that the veryend of the law may be defeated by the law itself being over-strictly defined. But Professor Kerr says that his formula has been in certain cases acted upon as a standard of adjudication by Courts of law in cases relating to obstruction of light; and he considers it of greater consequence that a jury should accept a standard as a guide, according to which professional witnesses might draw their conclusions as to matter of fact, than that either judge or jury should understand the nature of the formula itself or of the calculations upon which it is based. Of course if judge and jury, and the advisers of the plaintiff and defendant, in consequence of the agreement of scientific witnesses, all agree to accept such evidence, the whole matter is wonderfully simplified and set at rest; but it might be, on the other hand, a somewhat inconvenient retrospect to several of the parties concerned, for them to have accepted at second hand, and with their eyes shut, a formula which afterwards proved to require modifications such as to have involved, in any degree, a miscarriage of justice in cases already adjudicated according to the basis which it embodied. And I do not see how it is possible for such witnesses to arrive at agreement, as they appear to have done, upon a scientific question, if any portion of the key to the scientific result is accepted at the hands of one man. It then becomes not a matter of rational evidence, but a mere acceptance of one man's dictum.

I cannot bring these remarks to a close without expressing a regret that the title first officially announced for my paper of this evening should have been interpreted to imply an ungracious and unwarrantable attack upon an ingenious and useful invention, and only, as it might seem, through a momentary consciousness of weakness that need not—and ought not— to have been entertained. For a strong position does not dread the foe, and if my suggestions have seemed to you uncalled for, or untenable, let them be valued only at their true worth, and Professor Kerr will assuredly be glad to derive this additional testimony for the establishment of his theory, that it has proved thus far unassailable. If, on the other hand, there shall prove to be any truth in what I have brought forward, or any ground for the amendment of the now recognized system, will he not be the first to acknowledge it, and to take advantage of it for future use, supposing it to be not beneath his notice? Still further, if I shall have failed even to contribute to the general result, I shall yet have been instrumental in calling additional attention to his work, and to its importance, and possibly to have thrown some little additional light upon the subject itself.

And I am bound to say that that title was meant merely to indicate that there might be something to be said in addition, or in opposition if you will, to what had been already advanced; for I felt sure that Professor Kerr himself would be on the side of promoting rather than of stifling discussion, as carrying out the principles of this Institute—which exists far more for purposes of investigation than for the dogmatic laying down of the law. He himself, indeed, appealed to us in his reply to turn our attention to this branch of the subject, that we might, each of us, be "able to produce scientific reasons upon which an opinion might be founded."

The investigation of truth has been, if I may say so, an impulse of my life, and an unfailing source of pleasure no less than of profit. For just as it is with light from material reflection, as secondary to, yet emanating from, the light of the sky, even so have I myself learned by experience somewhat of the illuminative power of mental reflection for penetrating the gloom of an obscure subject,—reflection not from a small contracted area, but from as expansive a range of vision as circumstances will admit of obtaining;—and I can truly testify to the value of mental reflection to make up, however partially or imperfectly, for the lack of that pervading light which emanates more directly, more naturally, and more powerfully, from a wider range of learning, and as the Phrenologists would say, from a more "prominent Ideality." And if such investigations are carried on in a simple, honest, earnest spirit, there is but little room left for antagonism or ill-will; although it may be sometimes necessary to state unpalatable truths, or to tell honest convictions to unwilling ears.

One description of reflections I have always sedulously, if not always successfully, studied to avoid, viz. personal reflections on others; and if ever I have seen, or thought that I saw, from my own point of view, a truth which has apparently escaped the notice of others; and if I have endeavoured to urge it with a force sufficient to give utterance to the sincerity of my own convictions; yet it has always been my aim to set forth sound reasons for my belief,—if with candour yet not without courtesy. If upon the present occasion I have unhappily failed in my endeavour, and if I have unwittingly indulged in that positive and inconsiderate assertion of my opinions, which at the first announcement of my paper I was given to understand was my usual wont, I must simply crave your kind indulgence, confessing my inability all at once to amend such a very grave fault,—a fault of which I may truly say that I had hitherto lived in a state of happy unconsciousness.

In answer to Professor **Kerr** (during the reading of the paper), as to whether it had occurred to the lecturer to try his measures, by taking them on perpendiculars drawn from the base of the quadrant to the circumference, for the several divisions, and if so, why he had not alluded to it,—

Mr. **White** replied, that not only had it occurred to him, but it was the very question which he had put to the Professor, together with a sketch, at the previous meeting. It was very much the same thing as was arrived at by his (Mr. White's) own diagram, which, however, he had adopted, as following out more strictly the Professor's own directions as laid down in his book; but it would not account for the discrepancy which still existed.

Professor **Kerr**, Fellow, being called upon, said there was one gentleman present whom, he was sure, the meeting would like to hear on this subject—namely, Mr. Hesketh; and this especially, as he too seldom came amongst them. Probably no man had studied this subject more than Mr. Hesketh, or had exhibited greater skill, or acquired greater experience in dealing with it; and he himself was free to confess that, through his communication with Mr. Hesketh, he had been able to avail himself of most important suggestions of his. With regard to Mr. White's paper, he was personally obliged to him, for it displayed very considerable ingenuity and earnestness, and dealt with the subject with a frankness and fairness which they must all appreciate. In the main he considered it to agree with his own conclusions; and certainly the lecturer had been pleased to compliment him to a greater extent than he had reason to expect. Therefore he could not regard the paper as controverting his own views, but rather as confirming them by the result of Mr. White's own investigation of the subject. [Mr. **White** assented.] The most prominent point which the lecturer appeared anxious to make out was the value of reflected light—that is, light reflected from solid objects near the window—his doctrine being this: given a certain obstruction of the sky surface, it makes a great difference whether the obstructing object be remote or near. Now, the lecturer having read a certain paragraph on this point from his (Professor Kerr's) little treatise on "Ancient Lights," page 52, he was obliged to observe that there was another paragraph on page 51, which, if the lecturer had observed in time, might have saved him some trouble. The words were these—"The *effect of distance* must not be forgotten, inasmuch as the more remote the impediment is, the angle of obstruction being the same, the more does the influence of diffusion tend to countervail the effect." It was the exposition of this very principle which had occupied perhaps the largest space in the lecturer's argument, and after all there was no contradiction of that principle so much as suggested. Again, continuing the quotation, these words followed—"It is always best, however, to leave all such questions to be dealt with after the standard result is arrived at." This proposition also the lecturer had distinctly set forth as his own opinion; so that here again there was no difference suggested. But, in continuing the quotation further, he came to a proposition which the lecturer appeared not to recognize, the words being—"and, in this particular matter, it must be remembered that it is only a very considerable distance which can be of any palpable moment." This alone, then, was what the lecturer appeared to dispute; and all he could say in reply was, that it was a simple question of fact, not of theory—a matter of practical acquaintance with real cases—and he could only appeal to men of practical experience, feeling that they would decide without any hesitation in favour of the proposition as it stood. However, he hoped some day he might have to read, perhaps to answer, an affidavit by

Mr. White, urging in some desperate case this delicate doctrine; and he would be much interested in noting what the result would be. For, if so much value were attached to light reflected through a window from the street (as the lecturer had so elaborately argued), then, let it be observed, how great an injury might be done to a man's light by his neighbour painting, for instance, the pavement black! (Laughter.) It would be no jest if it came to filing a bill in Chancery; for if, as Mr. White said, this reflected light from the pavement were of so much value, then really such a thing as making the pavement of a dark colour (as if even the parochial authorities laid down the carriage-way in black, like asphalte, instead of white, like granite) would seriously be a case of damage. Mr. White would, of course, advise an application to the Court of Chancery for an injunction. For his own part, he did not think it would be granted—at least, if any mere mortal were on the bench. On the whole, reverting to the quotation about what he called the question of "distance," he could not help thinking that it fully met all that the lecturer had said about his question of "reflection." The next point which appeared to require remark was this: the lecturer was certainly in error when he spoke of his (Professor Kerr's) system of admeasurement of lighting as being dogmatically accepted in the Courts of law. Nothing could be thus accepted by the Courts except what was accepted by lawyers as a body, by way of legal exposition of the law. Lawyers could not possibly accept a mere system of surveyorship, to be taken by them without investigation. It was only evidence, and in equity especially the surveyor must give a good reason for his evidence before it would be even listened to; and thus it was that the very purpose of the system he had ventured to submit to the profession of architects was to enable them to give a reason for their opinions, in whatever circumstances it might happen to arise. To turn now to another point, the lecturer had expressed some contradiction of his (Professor Kerr's) tables for the valuation of lighting, but it was important to observe that this was done to a great extent, if not wholly, upon suppositious data. The lecturer had worked out the calculations for himself, and in so doing had developed certain steps of calculation which he *supposed* were those of the speaker; and it was upon those steps, so supposed, that the lecturer arrived at certain conclusions. Of course, he could not now undertake to follow those steps or to explain his own; the subject was complicated, and he was unprepared. All he could undertake to say was this,—that in practically dealing with cases of damage to lighting, anything like small differences were of no consequence; and those who had been connected with these cases before the Courts knew that if a plea hung upon such fine distinctions of calculation, it would be in vain to argue it. It was common sense which the Court looked for in all matters such as these: equity particularly claimed to be common sense, and nothing else. The minutiæ of his calculations, he need not say, would be in any form too complicated for discussion at that meeting; that was why he had on former occasions omitted details; he remembered (what the lecturer did not seem to have remembered) how impatient the meeting must necessarily be under what they could not possibly follow. With regard to other points, which had been, moreover, less clearly set forth in the lecture, he must ask leave, on account of the late hour, to pass over many of which he had taken note; but one word ought to be said upon the legal question. The lecturer had been about to enter into legal points when time obliged him to leave his conclusion unread; and when the paper came to be issued in print, he was afraid he would find a good deal of argument, such as had been already urged upon the Institute, about the state of the law. [Mr. White: No.] At any rate, above all things, he recommended architects to avoid debating the purely legal question: it was beyond their province, resting on this simple ground,—that the rights of proprietors of the soil were created by the law, and must be allowed to be governed strictly by such conditions as the law found it necessary to attach to proprietorship. These must be accepted at the hands of lawyers. More than this: looking at the thing in a practical point of view, he differed essentially from those who advocated an alteration of the law. He had himself very carefully studied this question of law, and, although making no pretension to legal knowledge, he thought he understood its bearings; and he considered that the law was right, and did not require any such amendment as had been suggested, but that it was the evidence of surveyors which required amendment, by the importation thereinto of scientific judgment. He must, by the way, explain to the lecturer that the diagram which accompanied his own lecture last year represented no real case, but quite an imaginary one; and therefore some of the remarks which Mr. White had made upon it would scarcely apply. With regard also to the case of *Mason* v. *Read*, he had to explain that it was settled privately, and therefore no legal point could be made out from the description which he had happened to give of it. Turning now to his friend Mr. Hesketh, there was one important and purely practical point which he believed that gentleman was disposed to press, and to which he would beg leave especially to direct his attention,—namely, his idea that a certain allowance ought to be made in calculations of admeasurement of lighting, to represent the fact that light from one direction might be delivered farther into a room than light from another direction. He himself had always thought this would be an unnecessary refinement (unless in very exceptional cases), but Mr. Hesketh might be able to make himself better understood. He concluded by formally moving a vote of thanks to Mr. White for his paper.

Mr. ROBERT HESKETH, Fellow, observed, with regard to reflected light, that he must agree with Mr. White—it was a thing of great importance; but, at the same time, it was a mere nothing in comparison with direct light from the sky, and that was the main thing which had to be dealt with in most cases. Another consideration would show the less necessity, in most cases, of taking the question of reflected light *directly* into account, because in a great measure it is done *incidentally*. Supposing, for instance, an obstruction existed 30 feet high, and was raised to an additional height of 30 feet. In estimating the nett obstruction of light, the old obstruction of 30 feet had to be diminished by the reflected light from the obstructing object; and so with the second 30 feet, the obstruction of the light from the sky had to be diminished by the light reflected from that 30 feet. Thus reflected light in such cases was to a great extent incidentally taken into account, though not entirely so. Professor Kerr had been kind enough to say that he agreed with his system in many respects, and so he did; and so far as the calculation of the obstruction up to the window itself was concerned, he believed they each arrived at nearly the same results. But he thought they differed in calculating the value of the light in the room itself. Thus, to take into account the diminution of the value of light from the sides owing to the thickness of the wall, and the oblique manner in which it passes through the window, he would instance a window 4 feet wide, where the rays from opposite the window would pass through the whole width of 4 feet; but from an angle of (say) 30° to the surface of the wall it might, perhaps, only pass through an effective width of 6 inches, and therefore the value of every ray from the latter direction would be one-eighth only of that of those from the former direction. Again, comparing the value of light from near the horizon with that from near the zenith, it was not only that the horizontal degrees were less as they got upwards, but also that the rays of light from near the zenith were diminished in value by the obilque manner in which they passed through the aperture. That had also to be accounted for. The system on which he had calculated for both was by allowing the effective width and height (as distinguished from the real width and height of the aperture) to be taken into account, and in each case multiplied into the formula he adopted. It was too much to expect the meeting to entertain an explanation of that calculation, though otherwise he would have been happy to give it; but that was the general system on which he had gone, and as far as the passage of light into the room was concerned, he differed from Professor Kerr. In one instance, where they had each calculated the diminution of light by a very oblique obstruction, Professor Kerr made it one-sixth, whereas he (Mr. Hesketh) made it one-tenth; so that the difference of their results was of considerable importance in such a case. He had great pleasure in seconding the proposition of a vote of thanks to Mr. White.

The PRESIDENT (Mr. A. J. B. BERESFORD HOPE, M.P.) said the inexorable clock warned them that the proceedings of the evening must now end; but as this subject was of considerable practical importance, he hoped they might be able to work it out, and, calling to mind Mr. Hesketh's offer, he (the President) was sure he only summed up the wishes of the meeting in saying what great pleasure they would have if that gentleman would read a paper on his system; that might be followed by a discussion, in which the various systems and processes might be considered in comparison. They would all agree in giving hearty thanks for the paper with which Mr. White had taken so much pains, as indeed he always did with every question he took up.

The vote of thanks having been passed by acclamation,

Mr. WHITE said his own thanks were due to the meeting for listening so patiently as they had done to this paper. It was a very long one, and he would make but one observation now upon what had been said. He could not consider it a mere matter of very small minutiæ that he had gone into. He had called special attention to the fact that the question of reflection was very small comparatively,* and he had made the measure of sky-surface the great point of his paper. He had carried out a distinct diagram himself, carefully marking every figure cast out. It had involved a fresh table. He had also given the trigonometrical ratio, which was of course much more accurate, and he had arrived at a result shewing a difference between about 30 per cent. of damage done, and 6 per cent. in a given instance upon the mere scale of measurement. If it involved such important results it could hardly be called a question of "small differences."

The meeting then adjourned.

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* NOTE.—See near bottom of p. 25, and, as regarding DISTANCE, see *italics* near bottom of p. 21. But Professor Kerr answered my argument as to "confinement of space" as if it were all one with what he had himself said as to the atmospheric effect of distance, in p. 51 of his treattise!—W.W.

ON THE PROBLEM OF PROVIDING DWELLINGS FOR THE POOR IN TOWNS.

By Professor KERR, Fellow.

Delivered before the Royal Institute of British Architects, on Monday, 3rd of December, 1866.

THE subject of my lecture is the Improvement of the Dwellings of the Poor in Towns, and I will treat of it, if you please, in five successive chapters.

CHAPTER I.—THE PRESENT POSITION OF THE CAUSE: WHICH IS NOT SATISFACTORY.

The problem of "Dwellings for the Labouring Classes," is one which has awakened a great deal of discussion for many years in this country. Persons of high rank and influential station have lent it all the aid, not only of their influence, but of their personal attention. More particularly in recent years, as I need scarcely remind you, there have been efforts made, based upon liberality the most profuse, and benevolence the most sincere and well directed, which have excited the admiration, one might say, of the world. At the same time I am bound to commence my argument by stating that the solution of the problem has not advanced very far. And this is not a statement of my own opinion in opposition to the opinions of others; I but repeat the conclusions at which the friends of the cause have themselves arrived, and which they have pronounced on many occasions, no doubt with much regret. We have the "Model Dwellings," which are familiar to most gentlemen present; and no doubt these in themselves present many features which are extremely advantageous for the occupation of certain sections of the labouring classes. They are thankfully accepted, we may also say, by those who occupy them. They are comfortable and wholesome; they are furnished with appliances which working people have not been able to command; and so far as those considerations go, we must all acknowledge, and indeed proclaim, in spite of whatever may be the want of success otherwise, that they are most creditable to this age and to this country. But on the other side of the account, we have to look fairly in the face the drawbacks which I have hinted at. First, there is the complaint made by the persons by whom the dwellings are occupied, that the rents, however reasonable, are very high for their means. Secondly, there is the complaint of those persons who have provided the money, who, as men of business, are obliged to say that they obtain but inadequate returns for their investment. Thirdly, we have to acknowledge the fact that, as the result of the first consideration, these dwellings are secured by a class altogether superior to the class for whose accommodation they were intended; so that the *poor*, properly so called, are at the present moment as unprovided as ever.

No more therefore need be urged to prove that there is a difficulty which fatally impedes the progress of the problem, and it is not easy to formulate that difficulty more simply than it was put by that very intelligent man of business, Lord Stanley, who, at a meeting held at the Mansion House two or three years ago, over which he presided, made a statement in something like the following words,—"These dwellings have to be let at rents of 5s. or 6s. a week; but there is a large section of the labouring class who cannot afford to pay 5s. or 6s. a week; and *what is to be done for them is a problem which still requires solution:*" and then his lordship went on to say, addressing of course a considerable assembly of influential persons interested in the cause, (and these concluding words are especially suggestive of the really practical weight of the difficulty), "this question however is one which this meeting is not called upon to solve."

Again, let us look at the proceedings of the Society of Arts, a society whose action is always characterised by much energy and largeness of views. We find that they appointed two or three years ago a large committee of very able and distinguished gentlemen, with the intention of investigating the whole subject in the most complete manner, and laying before the public definite conclusions and distinct principles. I do not know whether any supplemental report has been published by that committee within the last twelve months; but in the year 1865 they published a report which was very instructive and significant. It was to this effect in brief—that the building of dwellings for the labouring classes proved to be not commercially remunerative: that the returns were only 5 per cent.; and that all the committee could do was to recommend the enforcing of sanitary laws, the encouragement of government loans, and the promotion of certain amendments in the property laws;—conclusions which I am bound to submit to this meeting are certainly not satisfactory. If this is all we have arrived at after 25 or 30 years of effort, I think you will agree with me there must be a serious difficulty in the way of progress.

Then lately, for want of more feasible schemes, one has been brought prominently before the public in the form of a proposal for accommodating the working classes in suburban villages, specially laid out, and composed of houses specially built for their accommodation. To my mind this is no solution of the problem. It is merely putting in one tangible and perhaps very proper form the question of ground rent *versus* railway fares; but beyond that I cannot see that it is of any service.

I think I see in this large question one which can only be met by continuous individual endeavour —here a little and there a little, all contributing to some aggregate, which, perhaps in years, perhaps in ages, shall amount to a solution of the problem. It must, I say, be solved in detail: and my present purpose is to stimulate individual endeavours; and I may further say that in bringing the matter before the Institute of British Architects I proceed upon the idea that this is a problem to be solved by professional architects best of all, if they will but consent to give their attention to it. It is true no individual profit may be expected to attach to the effort, but there is great credit to be gained in the solution of the problem; and I think the public have a right to expect that even the most distinguished architects should give their best attention, for the general good, to a question of so much social importance.

CHAPTER II.—STATEMENT OF THE PROBLEM: WITH STATISTICS.

The problem at large necessarily divides itself into two points—first, that which deals with *Dwellings in the country*, and secondly, that which deals with *Dwellings in the large towns:* for the labouring classes in the country are evidently one peculiarly constituted section of the community; and the labouring classes of the towns as evidently another; each class with requirements of its own. We will for the present leave out of account the question of dwellings in the country, as we shall have quite enough to do in dealing with the question of dwellings in towns to-night: but in passing I would suggest one idea which has occurred to my own mind—not a very original one perhaps, but I give it for what it is worth, viz.—whether the solution of the problem as regards the country does not lie in the simple direction of the employment of economical materials. I have seen cottages—cabins if you like to call them so—recently built of wood, by a gentleman of large influence and great good sense, at a cost of about £30. each, which I am bound to say constitute exceedingly comfortable homes. I cannot help throwing out the hint for what it is worth; and now I pass on to our proper subject.

Turning then to town dwellings alone, I observe that there are two sub-divisions of the question, corresponding with two distinct classes of the community. There are, in fact, a superior class and an inferior class amongst the working population, between which I think I shall be able presently to draw a distinct line of demarcation.

The superior class consists of journeymen mechanics earning good wages, small masters of the same rank, and small dealers, home workers and piece workers of similar standing, who make good earnings by work executed in their own dwellings, and, lastly, a much larger class than is generally supposed of single-women-workers, who make no great show in the world, but numerically constitute a large proportion of the class, living sometimes alone and sometimes in pairs. On the other hand, the inferior class consists of the same sort of persons of a lower grade, as regards income chiefly, although in some other respects incidentally, but including the great mass of miscellaneous "labourers" so-called, and hangers-on to the outskirts of business. Properly speaking this inferior class is *the Poor*, and numerically it is greatly in the ascendant.

I will now attempt to describe in their ordinary form the dwellings of the superior class of the working population of towns. I will take you into a modest street—say in Islington, or Camden Town. You find the houses comparatively tidy in appearance, the street doors, as a rule, kept closed, and the children (who are obliged to use the street as their only playground,) comfortably clad and creditable in appearance. You find these houses let out in floors. They consist ordinarily of three floors—ground, first, and second floors, with sometimes attics and sometimes kitchens, which I need not here take into account; and each floor consists of the well known two rooms—the front room being about 15 feet by 12, and the back room the same size *minus* the width of the staircase, or about 9 by 12 or 13. The ground floor front room is curtailed by the width of the entrance passage, and on that level there is a back door behind the stairs. Each floor is occupied by a separate family; the back yard, with its water supply, waste grating, water closet and dust bin, being common to all the occupants. On each floor the front room is the sitting or living room, and the back room is the bed room. If the family consists of a married couple, with either no children or only very young ones, the children may be accommodated for sleeping on a small separate bedstead in the back room with the parents; or otherwise there may be in the sitting room a press or sofa bedstead for their accommodation. Indeed, even when this is not necessary for the accommodation of children it is very often found that people of this class, who are living as they consider comfortably, keep up the sofa bedstead in the sitting room for the occasional accommodation of a guest. And these people make no complaints about the accommodation: they are respectable members of the community, and look upon their position on the whole as a satisfactory one.

I will take you now into an adjoining street, occupied by the inferior class of workers. There the houses are perhaps of the same size, or a little smaller, but the street doors are not always kept closed; and the children are more numerous and not so well clad. You find these houses are not occupied in floors but in single rooms. Each family has one room, and as a rule one room only. Occasionally when a family is large they must perforce occupy two rooms, chiefly when the children are growing up and able to add to the general earnings; and in rare cases they may have three rooms; but generally speaking the *one* room is the type of these occupations. Now, please to observe that there is a radical distinction indicated between these two classes, when you compare the accommodation of the one and that of the other. To live in two rooms is quite a different state of things from living in one room; and this is where I consider the distinction is clearly constituted between the superior labouring class and the inferior labouring class, indicating of course a like distinction as regards the wants of those two classes respectively.

I have now to submit to you certain statistics which I think may be useful in the consideration of this question; and the figures I shall refer to are those of Mr. Henry Roberts, a member of this Institute, who, in a paper read to us in 1850, and afterwards published in a separate form, gives us data obtained from a house to house visitation instituted in the Parish of St. George, Hanover Square, in 1842, amongst the poorer classes, and furnishing we may suppose (at least I think a moment's reflection will lead us to expect so) a very fair criterion for our present purpose. Something like 1500 abodes were visited, and the result of the accounts kept is this:—That of families occupying *three rooms* and upwards, (and here observe that the "model plan" so familiar to all of us as a standard is one of three rooms and upwards), of those occupying three rooms and upwards there were only 8½ per cent.; of those occupying *two rooms* there were only 28 per cent.; and of those occupying *one room* there were 63½ per cent. This brings forcibly before us one fact, which we must accept and deal with as fact, for sentiment is quite out of place in this matter, much as it may have been indulged in—a fact which I ask you to accept in a mere business like way—that 63½ per cent. of the families of the lower labouring classes occupy tenements of single rooms.

The statistics then go on to deal with the number of beds, and I think we are here again entitled to consider that the houses thus visited afford us a fair criterion. Of families possessing *three or more beds* there were 13 per cent. (This I regard as an index to the size of the families, a thing which is generally very much misunderstood.) Of those possessing *two beds* there were 44 per cent.; and of those possessing *one bed only* there were 43 per cent. So that the rule appears to be amongst this class of labouring people that only a very small proportion require three beds, and that of the rest one-half require two beds, and the other half only one.

CHAPTER III.—THE LINE OF SOLUTION HITHERTO FOLLOWED: THE QUESTIONABLE RESULTS.

The line of solution has been this: the worst cases have been selected as the type. We have had in the newspapers volumes of demonstrative writings of all kinds about the distressing condition of the labouring classes at home; and what I say is that these always point to the idea I have suggested, namely, that philanthropists accept the worst cases as the type on which to base their operations. This is of course very natural; but I want you merely to understand that it is the fact. These worst cases are those of the largest families with the worst kind of conveniences. Now these data becoming impressed upon the mind of the benevolent, what is done? A model plan is conceived, and the form it takes is—what? Let me speak for a moment of what I call *the dogma of the three bed rooms*, a principle highly creditable no doubt to the good feeling of those who adopt it, but not necessarily correct as a matter of detail in plan. This dogma of the three bed rooms was very well and forcibly enunciated by Lord Shaftesbury the other day, I believe, at Nottingham, in words to this effect—"that no decent family could possibly be accommodated with fewer than three bed rooms,—one for the parents, one for boys, and one for girls." Of course we all agree that families sometimes require three; but the dogma, as it operates practically, takes the form—that there ought *always* to be three, with exceptions only to prove the rule; and accordingly, in model dwellings, three bed rooms are the rule, and less than three the occasional exception. The result in the end is simply this:—that these dwellings are not tenanted by the poor at all. They were intended to be tenanted by the poor; they have been based upon the supposed requirements of the poor, but, as matter of undisputed fact, they do not happen to be tenanted by that class in the end. Why? Because, I venture to say, first, the accommodation provided is beyond their requirements;—paradoxical as this may seem, to be obliged to grudge the poor such meagre luxuries, I shall have to show you as a sober fact, that this accommodation is beyond their wants. A second reason is, that the cost of that accommodation places it beyond their means to pay for.

Now let me state in more detail where I consider the weakness of these model plans to lie; and I ask you distinctly to understand that there is no idea of disparagement in what I have to say on this point: on the contrary, no one is more anxious than I am to give all credit to those excellent persons who have so honourably busied themselves in these undertakings; but I consider we are now dealing with the matter not as a mere matter of courtesy and politeness, but as a matter of business,—for in this light alone we, as professional men, may concern ourselves with it to public advantage. In describing these model plans I will pass by what I call *extravagances:* for instance, the idea that a colony of these dwellings should possess general wash-houses and drying apparatus; the notion of having baths, sometimes even private baths; the idea of a general lavatory; and that of a playground for the children: I pass all these by. I take the simplest form of the mere home itself. This gives us a living room, a special scullery, perhaps a coal closet or a pantry, often a private water closet, a cooking range, a copper, a sink, water supply of course, and a dust shoot, with, lastly, separate and special bed rooms, three as the basis of the design, and two or one in exceptional cases. Now I venture to say that, if the picture I have drawn of the condition of the labouring classes, the superior and the inferior, is a correct one, the plan I have just described applies to the superior class but seldom, and to the inferior class never. In a word, the accommodation is too large and it is too complicated.

Now let me observe that, in order to economise expense, the size of the apartments I have mentioned is reduced to a minimum. The living room is made about 12 ft. by 10; the scullery 10 by 7; the bed rooms 12 by 9, 9 by 8, and 7 by 7. These dimensions are within a trifle what we see in numerous places; but after all this economy of size the cost is undisguisedly announced to be from £150. to £200. per dwelling. The comparison of cost with returns being familiar to every one present, I need scarcely say that in addition to the interest upon this outlay we must allow for ground rent, taxes, repairs, and management, and then we come to this, as a matter of fact, furnished to us by the promoters themselves of these excellent schemes, still actuated by the best intentions,—that the lowest possible rents are 5s. or 6s. per week. Then, even at these terms, as we are told, the returns are only 5 or 6 per cent. upon the capital: the Society of Arts says only 5 per cent;* and this too, with all the advantages attaching to new buildings, and to picked tenants,—the competition for these dwellings being so keen that the proprietors appear to be embarrassed sometimes how to choose amongst the applicants. These results, therefore, we must consider to be admitted as so far unsatisfactory.

CHAPTER IV.—What is really wanted? Why not Single-room Accommodation?

The suggestion I make in the words *Single room accommodation* may be somewhat startling at first sight; it may well appear strange for an architect to stand here and propose that English families should be confined to the system of single rooms; but those accustomed to professonal enquiry will not adopt that precise conclusion till they have heard me further.

What is it then that the poor really do ask for? The rent, they say, must not be above 4s. per week. This must include taxes and water supply. Then the accommodation must not be too large for their furnishing, because we must bear in mind that it is quite as impossible for a poor man to furnish three or four desirable rooms at a cost of £ 10. as it is for a poor gentleman to furnish a desirable country house at £ 5000. Secondly, the accommodation must not be too large for the means of cleaning; for it is just as much beyond the power of the poor man's wife, in addition to her other toil, to keep the three or four rooms clean, as it is for the poor gentleman's wife to maintain upon nothing a retinue of servants for the large house which otherwise would be so welcome. And thirdly, the accommodation must not be too complex for the habits of the poor; for their habits are very simple and their usage of a house is very rough; and therefore the more you furnish them with ingenious appliances and apparatus, the more they must look at such things, not in the light of their desirableness and so called utility, but in the light of the danger of breaking them and having to make good the damage. Looking then at all these considerations, let us ask the labouring man to point us to something which, imperfectly perhaps, but distinctively, indicates or expresses what it is he requires. Then, I say, he points at once to the single room which he has always been accustomed to; it is in fact an institution with him,—improve it as much as you can, but why ignore it?

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* It does not, however seem to be very clear what this per centage really represents; whether nett, or some form of gross returns.

Let me remind you of the history of single room accommodation. Indeed I need scarcely tell you of the Mediæval "Hall," and of how it was the average *house* of even the gentry of this country up to the fifteenth century, the kitchen of the establishment, the dining room of the establishment, the drawing room of the establishment, and the sleeping room of the establishment; where the honoured guest was placed at mid-day at the right hand of the lord at the table, in the evening sate by my lady's ear at a snug corner of the ingle, and for the night was awarded some other comfortable corner, where he could lie down on the straw or rushes which covered the floor, with his feet to the fire. Moreover, as you know, this single room accommodation did not die out at the date I have named,—but was continued as the average accommodation of the class of yeomen in this country down to the 17th, and in many cases to the 18th century. Indeed in remote districts of the kingdom, and especially perhaps in Scotland, Ireland, and Wales, single room accommodation has been very much the rule amongst small farmers down to the present day; and in other European countries it is even still more the rule.

What then are our objections to this single room principle for the dwellings of the poor? As regards convenience there can be none; in fact the poor man's wife will tell you that she finds it more convenient rather than less so, with regard to the work of the house; her cooking is more conveniently done in her "room" than in a scullery; her cleaning is much more conveniently done if it is all within one set of four walls; her attendance upon her children is much more easy both during the day and for the night; so that as far as mere convenience goes, for the class in question nothing can be better. To come then at once to the point, the only objection is on the score of *delicacy*. I am prepared, I hope, to give full force to that objection, and to provide for it; but, I ask, do we not in the arguments which we are so accustomed to use—do we not assume too much with regard to the violation of the principles of delicacy in the homes of the poor? Do we properly bear in mind that those who are badly provided in accommodation are only driven to a number of little contrivances, of which those who are better provided may have no very ready conception? As a rule, I for one am bold enough to deny that the women of the working classes are forced into indelicacy; and I deny it, not as matter of sentiment, but as matter of fact,—for instance, upon my experience as a district surveyor, in a locality where, with however much riches, there is no lack of poverty. In a word, contrivance, and especially feminine contrivance (which is chiefly concerned), will seldom fail to supply incidental resources to meet the demands of the occasion, unless in very extraordinary cases indeed. Moreover let us not forget that there are degrees in delicacy, and that it is possible to originate demands, (I will even go so far as to say that I could point to certain demands already existing in this respect,) which would scarcely be acceptable to some of ourselves. Not to go no further, let me, for merely a vague illustration on other ground, refer to the arrangements which necessarily prevail in schools for the children of the better classes,—I mean with reference to the contrast between the fastidious separation of the sexes in such schools, and the total absence of such separation in the schools for the children of the poor. You have also another sort of illustration in the French system of separate beds for married persons, which we in England consider a matter of over-refinement, especially when compared with some other cases in which our neighbours are equally surprised at the English habits. I give these as illustrations of the principle that there are conventional degrees of delicacy; and I therefore ask you—and it is not much—to make due allowances for the poor in the way of common ingenuity, and not jump to the conclusion that they are positively degraded, when the fact is that they are only negatively unrefined. At the same time I do not desire for one moment to overlook the evil influences of really inadequate domestic accommodation, or to throw discredit on the desire, even if it should occasionally go to extremes, to provide for the poor whatever refinements are within their means.

CHAPTER V.—An Experiment in Single Rooms.

I have now to offer you with all humility an experiment of my own,—I wish it to be taken as only an experiment,—as to what can be done upon the principle of single room accommodation for the poor; for I feel that it is altogether vain, in a great question such as this, for any one to content himself with merely disapproving of what has been hitherto attempted, unless he can bring forward for fair comparison some suggestion of his own. I will first, however, make a sort of simple classification of the poor as families, in order to ascertain what proportion of the class can comfortably accommodate themselves in single rooms; a much larger proportion, by the bye, than at first sight you might suppose. There is first a very large section, composed as I have already said, of single women. There is further a large section constituted by married couples—and I am sorry to say many unmarried—who have no children. There is again a large number of married couples who have very young children. Then there is also another proportion of married couples whose children have grown up and left the parental home. There is still another proportion, larger than we could wish, of widows with young children and widows with girls only. Now, none of the sections here enumerated have any pressing need for a second room. Then if we come to the class of persons for whom a second room is absolutely necessary, we find it to be composed almost exclusively of parents with children growing up; and even these I venture to submit may possibly, before we have done, be accommodated, not perhaps in a single room, but upon some similar principle if they cannot afford anything better.

Let me now revert to what I shall call Mr. Roberts' statistics with regard to the number of beds; in order to show you visibly, as it were, how the calculation comes out with regard to the proportion of families which can be accommodated comfortably in single rooms; because, as I take it, if we can accommodate a large proportion of the poor in these single rooms we have got a long way towards meeting their limited means, and have thus effected to a corresponding extent, a solution of the great problem in hand. By the statistics of Mr. Roberts already given, it has been shown that the per-centages of poor families occupying one, two, and three rooms respectively are 63½, 28, and 8½: whilst the numbers possessing one, two, and three beds respectively are 43, 44, and 13 per cent. Now let us construct a table whereby to apply these per-centages of beds to these per-centages of rooms; it must be mere guesswork so far, but it will be found by experiment that there is but a very limited range of guessing, and I have no hesitation in submitting the following table as one which cannot at the worst be very far in error.

	1 Bed.	1 Bed. and children*	2 Beds.	2 Beds. and children	3 Beds.	
	= 43.	= 44.		= 13.		Totals per Ct.
1 Room	35	15	10½	3	0	= 63½
2 Rooms	8	10	6½	2	1½	= 28
3 Rooms	0	0	2	2	4½	= 8½
	= 58 Requiring 1 Bedroom.	= 34 Requiring 2 Bedrooms.		= 8 Requiring 3 Bedrooms.		Totals per Ct.

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* "And children" signifies the need for a merely supplementary bed, without a separate bedroom, for young children.

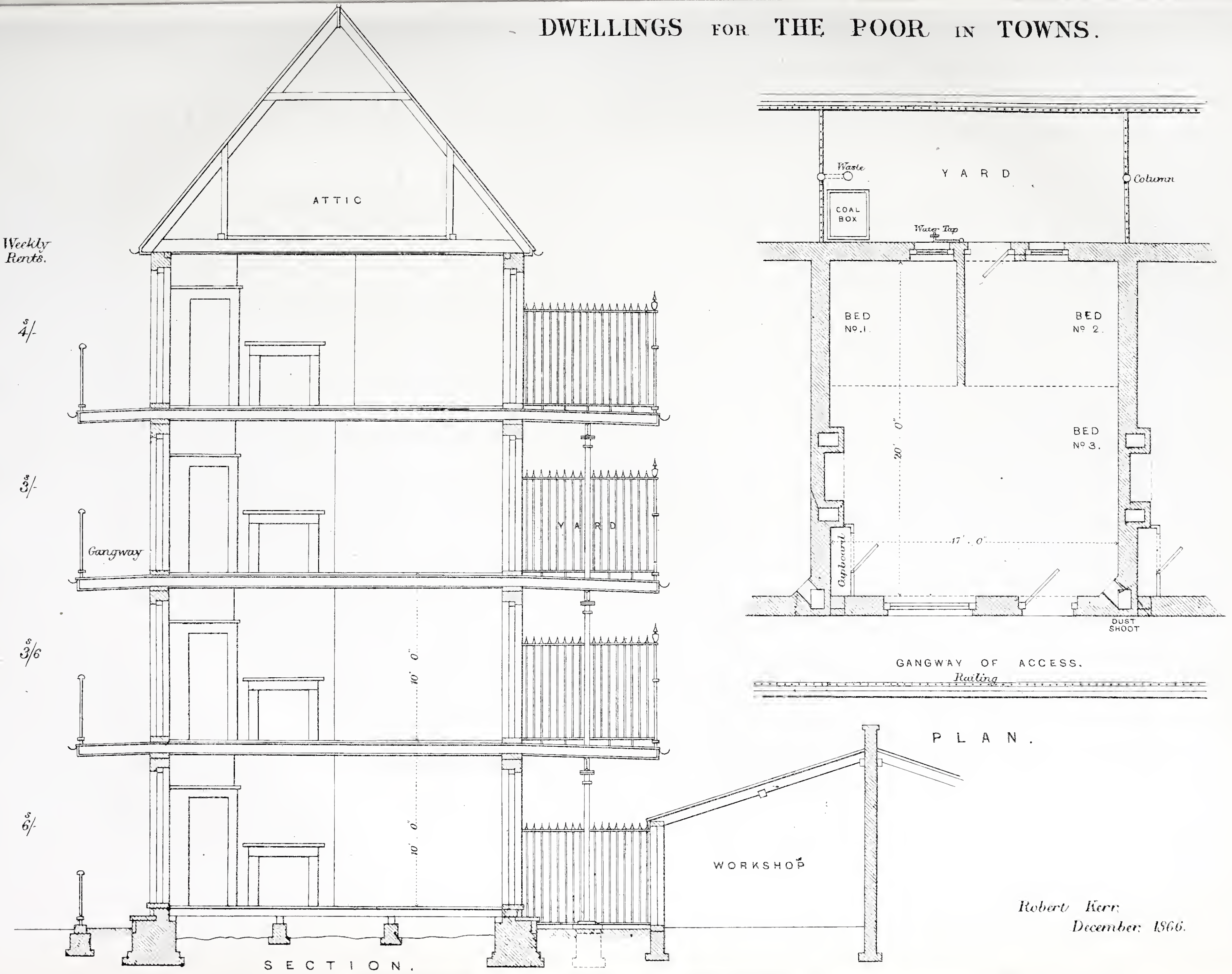
That is to say, taking the $63\frac{1}{2}$ per cent. of single room families, I assign to 35 one bed (as people without children); to 15, one bed and a children's bed; to $10\frac{1}{2}$, two beds for adults; to 2, two and a children's bed; and to none three beds for adults; and so on with the other classes: it is then a simple conclusion that the 35, 15, and 8 of the table require only one room; the $10\frac{1}{2}$, 3, 10, $6\frac{1}{2}$, 2, and 2, only two rooms; and the remaining $1\frac{1}{2}$, 2, and $4\frac{1}{2}$, three rooms. It is easy for any enquirer to make his own appropriations in the way here indicated; but the conclusions will be sufficiently near to mine; (inasmuch as we have to keep not only the lateral columns to the totals of $63\frac{1}{2}$, 28, and $8\frac{1}{2}$, but the vertical columns to the totals of 43, 44, and 13;) and I think I am entitled to say that of the families of the poor, as matter of fact, at least *one half* require no more than *one room*, *one third* requiring *two rooms*, and only about 8 *per cent.* having any real need for *three rooms;* assuredly very different conclusions from those on which the model plans have been based.

Allow me now to explain what I call my experimental design, (*see Diagram*). I repeat that it would be vain for me to come before you and profess to deal with a subject of this sort by merely disapproving the plans of others. I am bound to offer something of my own, even if only an *experiment*, as I sincerely consider this design to be. Perhaps it may not prove to be worth much, but if it goes even a little way towards the solution of the problem in detail, this will be a sufficient gratification to me, and the most qualified approval will be sufficient acknowledgment.

In the first place, here is a single room of good size (for it is more space than poor people seem first to want), 20 feet in length by 17 feet in breadth. Such rooms are to be formed as a series, on whatever general plan may be desirable according to circumstances, and in several successive stories, probably four. Along the front runs a balcony, say 4 feet wide, as a passage way for access; and along the back there runs a similar balcony, say 8 feet wide, affording to each room the equivalent of a small backyard. This last may serve for drying linen, (for the poor women cannot always avail themselves of public wash-houses, and prefer doing their "little bit of washing" at home); it may also be used as the little playground of the children, who must otherwise be turned into the street to shift for themselves; it may be a little workyard; one might even say possibly a little garden for want of a better; all this can of course be arranged according to circumstances. Then there must of course be in a suitable position a staircase common to all, and probably at the back of this I should put water closets for each story in succession. On the ground floor a workshop may be added in the back yard. In the roof we can make a supplementary room or attic, attached to the room below, so that those who desire more accommodation than the standard single room can have it on reasonable terms, in consideration of going to the top floor.

Turning now to the interior of the room itself, I propose to have at the back part (see plan), extending about 7 feet into the room, a half brick partition, as the basis of bedroom accommodation. The dwelling still retains for all practical purposes its form of a single room; whilst the compartments at the back become at once available for various special uses,—a work room, for instance, for a tailor, a shoemaker, a needlewoman, or any one of a score of such home-workers,—a scullery if wanted, a wash-house, —or, of course, a bed closet. Observe that the half-brick partition is put in such a position as to make the one compartment about 9 feet wide and the other $7\frac{1}{2}$; each having a small window (merely sufficient for lighting the compartment for whatever purposes it may be used,) and the larger one containing also the back door. The front door and window need no description. We now come to the beds. We have already seen that over 50 per cent. of the poor are sufficiently accommodated by having one bedstead, which may of course, in most instances, occupy one of the back compartments without more ado. But in cases where privacy is required I would merely enclose one or both compartments by moveable partitions of deal, (perhaps like sliding shutters, with fixed head and sill); and as regards the non-

DWELLINGS FOR THE POOR IN TOWNS.



SECTION.

PLAN.

Robert Kerr,
December 1866.

transmission of sound from one compartment to another, which is in a great measure the real question of delicacy, the brick partition would be, I think, sufficient. In fact, for all the purposes of the poor, we thus have, I submit, accommodation for one adults' bed; or one for adults and one for children; or two for adults; or one more for children; or, in extreme cases, three for adults (namely, one in each enclosed compartment and one in the main room); and all this without allowing for the employment of press bedsteads, &c., which we know helps the matter very materially.

The cupboard shown on the plan, I need only remark, is sufficiently large, and is ventilated by air-bricks. The coal-box at the back explains itself; it ought to be large enough to hold a sack of coals, and we must not imagine that there is any objection to the coals being carried through what is perhaps one of the bed rooms. The water supply needs no description: the waste pipe I would make a good sized trap, led into the hollow column which supports the balcony; the dust shoot would be conveniently managed without difficulty; and the iron railings ought, I think, to be 4 feet high along the edge of both balconies, and 6 feet high, or more, between the yards,—or otherwise for greater privacy, there might be close fences in the latter case.

I make no provision for a cooking range, with its boiler liable to burst by the slightest neglect, and its oven perhaps never used, and both, in one way or another, wasting fuel. I propose nothing beyond a common stove. I provide no copper, believing that the good woman will prefer to boil the little water she requires in a saucepan. There is no sink, (and especially would I have nothing of the sort inside the house); but there is a waste trap, of much more use, namely, to carry off the slops of the household.

It may be thought that the plan before you is less snug than the diminutive parlours of the model plans, and more airy generally than would suit the poor man's means of warming. It has been remarked by a most intelligent designer and writer on the subject, that "if there is anything the labouring classes hate it is fresh air." Now I cannot admit this to be a fair statement: indeed I would point to the fact, for instance, that our servants, particularly those in the nursery, are apt to let into the house in cold weather a good deal more fresh air than we ourselves like: but what our poor people do object to is the unwelcome indoor *draught*, which it is so difficult to keep out of their poor little rooms; and I am bold enough to say that, in this dwelling which I have ventured to lay before you, its spaciousness would be the best possible cure for all such evils; I should expect to see either the front or the back door standing open all day as in country cottages; and if you are afraid of the place being too large for the poor man's fire, I submit that a spacious and airy chamber needs much less of mere fire than the stuffy little room whose unwholesomeness no fire can correct.

The structure of the floors is proposed to be an economical adaptation of iron joists and concrete, fire proof; the joists bent a little at the balconies, to shed the water outwards. Upon this I would form wooden flooring and plaster ceilings, with tiles for the balconies. The doors and windows, and indeed all fittings, ought to be made of the simplest and least expensive kind, rough and strong; not only to lessen the aggregate cost, but also to avoid all refinements and complexities, which lead to dilapidation, not to speak of every-day embarrassment, in the hands of simple and awkward people.

From first to last my chief purpose is to discard all sorts of little superfluities; to contrive a dwelling of the simplest possible kind; to keep clear, not only of all that leads to expense in building, but of all that leads to expense in humble housekeeping; to make a place which shall be easily furnished, easily cleaned, in every way easily attended to; divested not only of what is showy, but of what is perishable and breakable, of what tends to seediness, and squalor, and stench and dirty defacement, as distinguished from honest wear and tear however rough: and I should not have been even so far satisfied with my project as to lay it before the Institute if I had not seen my way to assert the expectation that a pound or two of soft soap and a scrubbing brush, a pail or two of whitewash, and a good day's work, would be sufficient at any time within ten or a dozen years "to put the property into tenantable repair."

At the same time I wish it to be really understood that I have no feeling of a personal kind about this plan. It is an experiment, and may prove a failure. I offer it as a mere contribution, for what it is worth, towards the solution of the problem by the investigations of this Institute; I make my attempt merely to stimulate others to make theirs. But I venture to think that this plan would at any rate accommodate in a humble way a great many kinds of labouring people at a very inexpensive rent; and this is the light, I think, in which we must look at all designs of the kind.

I will now bespeak your attention for my estimate of outlay and returns. And I must remark that about this apparently simple question of returns there has been an incredible amount of visionary declamation indulged in by orators and writers. The gist of it is simply this, that the man who expects a dividend on his investment in dwellings for the poor is a miserable usurer. I was particularly struck with the argument of one writer in a professional journal, who was extravagantly irritated by the circumstance of some advocate of the model dwellings quoting as a reasonable idea that there ought to be 6 or 8 per cent. returns upon property of this kind:—"Between you and me, Mr. Editor," at last wrote this earnest logician, "I venture to think that the devil has an insidious hand in all this!" Now one advantage I shall possess in this Institute is that no one, I hope, will be so unreasonable as to introduce this line of argument. In a word, I must take leave to assume that my hearers will every one accept the principle that a fair return for investment is not only a thing to be hoped for, but a *sine quâ non*.

I will not trouble the meeting with the details of my estimates, but I may say that a design so very simple in its construction is equally simple in valuation; and, to come to the point at once, the result of my calculation is that one of these rooms, including its share in the general staircase, water closets, and water service, could be built at a prime cost of £70. Putting, therefore, the outlay at this amount, I suggest that a return of 9 per cent. thereon would be reasonable, including repairs, property tax, collection of rents, and losses: ground rent I will provide for presently. This 9 per cent. amounts to £6. 6s., water and taxes I put at £1. 10s., and the total is £7. 16s.; equal to 3s. per week. The ground rent on a number of these dwellings, in a suitable locality, would come to very little on each. (For instance, at 40 rooms per acre, × 4 stories of rooms, = 160 dwellings per acre, including roads, 10 shillings per dwelling per annum, capitalized at 4 per cent., would correspond with a value of £2000. per acre, including roads and drains). When, therefore, I assign (as on the diagram) the standard rent of 3 shillings per week to the second floor room; 3s. 6d. to the first floor room; 6s. to the ground floor room, including the workshop; and 4s. to the third floor room with the attic attached, I consider that I have a margin on the ground and first floor rents, after deducting for a trifling loss on that of the third floor and attic, of about 1s. 6d. per week, or £3. 18s. per annum, to meet ground rent on very nearly the exact terms above calculated.

In conclusion, I have to ask you to keep within certain limits (if you so far agree with me,) the discussion which I hope I have now initiated on this important subject. First, let me say that it will be vain to confine your attention to any mere approval or disapproval of the details of the plan which I submit as an experiment. I shall be delighted if it is thought worthy of being improved upon; but I am anxious that the great question involved should be studied at large on its own merits, and not wrapped up in this or in any plan whatever.

Again, in discussing a subject so grave and weighty in its own issues, and so purely scientific of its kind, let me entreat you to avoid most particularly all mere sentiment. I cannot but think that too much sentiment has been imparted into the discussion of the subject hitherto. It is not a question to be solved by virtuous declamation or passionate description, or by mere aspirations, however definite they may seem to be, after some Utopian state of things which is, to say the least, unattainable. I think we have rather to consider, as men of business, and especially as experts in building business, this question:—How are the public to get over this hitch, which Lord Stanley so pointedly defined, and how to do so by a process strictly business-like, based upon facts and figures?

I must next ask you to discard altogether such views as involve a reliance upon charity; for the poor do not ask to be treated in this matter as paupers, but quite the reverse,—they ask a plain business-like question in an honest and independent spirit,—"Can you or can you not provide us with better accommodation than these little dirty rooms in which we at present dwell, without obliging us to pay greater rents, and at the same time providing for the builder a fair scale of remuneration for his outlay?"

Then, I say, we ought to discard altogether the idea of state aid; for I am quite sure that any scheme based upon an acknowledged deficiency, which is to be made good by the state,—or in other words, based upon what can only be an appeal *ad misericordiam* to the public purse, for assistance in the work of building at a loss,—must sooner or later, in one way or another, come to inevitable ruin, by the mere operation of the natural laws of every-day commerce. What is it even to lend money (if this be all) at a lower rate of interest than the auction mart proves to be the market value of the security offered?

I ask you once more not to overlook the objection which rough and ready poor people have to needless refinements being forced upon them. Their habits are, as I have repeatedly urged, very simple, and they prefer to live in that simple system; just as much as it is a serious matter for one of us to remove from a house at £100. a year to one at £150, the latter of course having a great many admirable refinements and most desirable conveniences; in other words, just as we inevitably discover that the additional rent and taxes are by no means the end of the matter, but that an advance on the whole cost of living is involved, just so the poor man, if you force additional accommodation and conveniences upon him which he has not been accustomed to, is led into a style of living (humble as it may be after all) which he cannot afford to maintain.

Then I ask you, in one last word, to refuse to apply to this question any other more pretentious test than common sense; and to confine discussion, at present, to this particular enquiry, which I venture to think will be more than sufficient for the time you can devote to it, viz.:—how to provide in the best form exactly what is wanted for a poor man's home; and how to provide it at a remunerative rent.

The PRESIDENT, having suggested the adjournment of the discussion till the next meeting, took the opportunity to thank Professor Kerr for the way in which he had placed this matter before the meeting as one of "business;" as one in which he would not say they should discard philanthropy altogether, but as calling philanthropy in aid in the application of the best means to the best end. It might be matter of business, but it was a philanthropic art also to endeavour to add to the comforts and conveniences of our fellow creatures without overtaxing their pockets to give it them. It was very desirable, he thought, to discuss this question in relation to the country. They had talked about the necessity of providing better accommodation for the poor, but some persons might have mixed up together the two perfectly different questions of town and country. His own practical experience was rather on the side of the country; and he hoped some day that aspect of the case would be discussed by this Institute. In the mean time let them deal with the great question of town buildings in connection with that combination of social and other considerations which went to make up the idea of a town. He hoped when the subject came on for discussion, gentlemen would bring forward views and ideas of their own, which would combine to make the discussion a really practical one, and which would form a valuable document if the matter came before Parliament or elsewhere next year.

On the motion of Professor LEWIS, seconded by Mr. SPENCER-BELL, a vote of thanks was passed to Professor Kerr, and the meeting adjourned.

DISCUSSION ON PROFESSOR KERR'S PAPER—"ON THE PROBLEM OF PROVIDING DWELLINGS FOR THE POOR."

At the Ordinary General Meeting of the Royal Institute of British Architects, 17th of December, 1866.

The Chairman (Professor Thomas H. Lewis, V.P.), having expressed his regret at the absence of the President, who had been called away on urgent business; also that of Mr. Alderman Waterlow, and other gentlemen who took a deep interest in this subject, called upon Mr. Spencer-Bell to open the discussion.

Mr. James Spencer-Bell, Fellow, remarked, that Professor Kerr deserved their thanks for having laid so much stress on one principle in the erection of dwellings for the labouring classes, which had hitherto been too much forgotten: that was that it should be done on a purely commercial and not on a charitable principle. The want of proper recognition of that principle he believed was the reason why so many societies formed for the purpose of carrying out this object had failed up to the present time. He was himself a shareholder in two societies which for the first dozen years paid no dividend, and then only 1½ or 2 per cent. and ultimately 3 per cent. That would be all very well if the evil to be attacked were a small one, but it now existed on such a gigantic scale that charitable efforts must entirely fail to counteract it. A great many persons would be willing to invest their money at a return of 5 or 6 per cent., who were not in a position to give £50. or even £20. as charity to promote this object: therefore unless it was conducted on commercial principles the problem was not solved. That was a condition of things which had arisen from what Professor Kerr termed "sentiment." Then there was another evil—the "dogmatising," which had had great force in preventing the success of schemes for providing dwellings. The dogmatisers set out with the idea that the labouring classes must have a certain amount of accommodation—a certain number of bed rooms: that if there were five children in a family there must be three bed rooms, a scullery and a kitchen in addition to the sitting room. It was impossible to provide that accommodation which was so much beyond what the labouring class was accustomed to, and at the same time make the thing commercially remunerative. It was more than they wished for if they got it at the same rent, but it was still more against their wishes if they had to pay an increased rent in proportion. On the other hand if they did not pay rent proportionate to the accommodation the cost was provided by some one else, and then the scheme became a charity, and they made the labouring class, who ought and wished to be independent, receivers of alms. That was after all only an artificial state of things which could never be developed to the point they desired—viz. that the labouring classes should have good and healthy dwellings to reside in. So far he entirely agreed with Professor Kerr's views. Now to refer for a moment to the plan which that gentleman had brought before them. With all submission he (Mr. Bell) did not think that plan solved the problem. In the room there provided—20 by 17 feet, there was as much surface as was required for a good three-roomed house. On the table there were some plans by Mr. Burges, in which three rooms were provided with considerably less surface than this. Supposing this plan were made with a cross wall, say with an area of 22 by 15 feet, they would get three rooms. Professor Kerr might reply that there would be the additional expense of the partition and doors, and that therefore the cost would be much more than the single room plan, but as much would be saved by reducing the scantling of roof and floors, on account of the reduced bearing. There was another point on which he differed from Professor Kerr; that was on the question of ground rents. He did not think practically they could ignore the question of ground rents. It was often found that the ground rent was that which made the thing pay or not pay. Professor Kerr had put the interest for the outlay at 9 per cent., but he (Mr. Bell) believed that the ground rent would absorb at least 2 per cent. of that. They were not talking of suburbs: but there was no land to be got within seven miles of St Paul's at such a price that the ground rent would not form an important item in the gross rent. He should be glad if Professor Kerr could point out some ground at a moderate cost in St. Marylebone or St. Pancras, as he was sure the society to which he belonged would be glad to enter into negociation for it. That which, in the experience of these societies, had been found to pay best was buying up small houses, such as the poor were in the habit of living in, repairing them, fitting them with closets and providing water supply and efficient drainage, opening the windows and making them healthy and clean. It was found that these were the sort of houses which the labouring classes like, as they were those they had been in the habit of living in. They had a decided objection to those large and formally conducted establishments where, as they considered, they were constantly under a supervision which was irksome to them. The results of the operations in this direction of the Marylebone Society had been to improve those localities to an extent that met with the entire approval of the officers of health, instead of being liable to constant complaints under the former state of things; and at the same time a respectable class of working people were brought together, in the place of a population of a character that no one but a courageous policeman dare enter the place. Now the localities were clean, healthy, and kept in perfect order. In conclusion, he remarked that some of the great landowners of London had an objection to anything like model lodging houses. On the Portland Estate no ground would be let for such a purpose.

MR. T. CHATFIELD CLARK thought the objections to the plan propounded by Professor Kerr were two-fold:—first, he thought the theory was wrong in respect of what should be done for the labouring classes. It was a fallacy to say that because the poor were, as a rule, fond of living in one room, persons trying to improve the condition of their dwellings ought not to provide more accommodation; his own impression was directly contrary to that. Those who were acquainted with the habits of the poor—and he was so himself to a certain extent—would find that there was a strong feeling on the part of right-minded mothers against bringing up a family of children in only one room. What they had to do was to try and give the poor a higher idea of what their condition ought to be. With regard to the second point in this branch of the subject, it appeared to him that the calculations given as to the number of beds possessed by poor families were fallacious. He apprehended there were no means of ascertaining how many people slept in one bed; therefore, to present a statement about the number of beds, was giving fallacious results as to the number of persons occupying the room. It was related in the *Builder*, that as many as three and four, and sometimes more, slept under one coverlet,—the children being placed at the bottom of the bed. That, he believed, destroyed the statistical part of the argument, with respect to the beds. Coming now to Professor Kerr's calculations and estimates of his plan, he found that the area of ground used was 888 superficial feet; he took that at 4d. per foot rental per annum, making £14. 16s. for the ground. He had cubed up the building and made it 22,144 feet, at 6d. per foot cube, not measuring the galleries, the staircases, or conveniences, but considering those additions in the price. Some might say that was a high estimate for a building of this kind; but he thought if they looked at the drawing—seeing it was constructed with iron floors, the large amount of gallery space and eaves gutters at each end, involving four sets of gutters front and back—he did not think that the price was too high at 6d. per foot. That brought out the cost at £553. 12s.; Mr. Alderman Waterlow roughly estimated it at the last meeting at £500.; six per cent. upon that sum would be £33. 4s. per annum. The total to make that a good speculation ought to be a rental of £48. a year. Now the receipts would be, 52 weeks at 16s. 6d. per week,=£42. 18s. per annum. The experience of most people proved that the taxes amounted to one-third, not on the rack rental, but the rateable rental; that on £30.,=£10.;

insurance on £350. at 3s. per cent., premium and duty,=10s. 6d.; repairs 10 per cent. on £30.,=£3.; commission for collection of rents, risk of rooms being unlet, &c., at 5 per cent.,=£2. 3s.; these made a total of £15. 13s. 6d. as the outlay, to that must be added the ground rent=£14. 16s., making a grand total of £30. 9s. 6d., to be deducted from £42. 18s., leaving a balance of £12. 8s. 6d., or barely 2½ per cent. upon the outlay,—a very low rate of interest it must be admitted. That was the result he had arrived at, but he should be glad to be corrected if he was in error. He very much regretted the absence this evening of Mr. Alderman Waterlow, as he had given a good deal of attention to the subject, and had so far worked it out satisfactorily; but he thought the worthy Alderman's plans were open to two or three objections. The plan of the building was too intricate, the passages tortuous. In the next place the buildings were too cheaply finished, and would cost a considerable sum in repairs in a few years time, and further than that, he did not think the materials used were proved to be of a durable and lasting character; but on the whole Mr. Alderman Waterlow was entitled to the credit of carrying out this system more successfully, commercially speaking, he believed, than any other man had done. His (Mr. Clarke's) ideas in connection with this matter were much akin to those expressed by Mr. Spencer-Bell, viz.:—that companies should be formed to take on lease—inasmuch as freehold property in London was so difficult to be got—substantial and good property on repairing leases; that the property should be well drained, put into good repair, and the necessary water-closets and water supply provided; that whole courts or streets of such property should be taken and so treated. The present landlords would be content with a fair rate of interest on the security of a substantial company, and a sinking fund should be established to pay off the premiums upon the leases. Working on some such plan as this no large amount of capital would be required, and it would be a means of giving the poor what they require, viz.:—a comfortable house not in a block of buildings. There was a certain amount of prejudice against these immense blocks of buildings; a great one on the part of respectable parents against the promiscuous mixing together of large numbers of children during their play hours, by which they sometimes became contaminated, being beyond the parental influence and control. He believed the poor preferred to live in smaller classes of houses. A moderate amount of capital would suffice for the improvement of substantially good property of this description. There must, of course, be a collector or agent to each court or block. He would not approve of a company taking less than a dozen or twenty of these houses in any court or small street. He was persuaded this plan might be worked out on a larger scale than had yet been done; but, whatever they did, he hoped they would not bend to the idea of what the poor fancy they want. They must give them something better than they have at present. Consider what it must be to eat, drink, and sleep in the same room! How much it must affect the health. They had to begin each day in the room they slept in. They were not fond of throwing up the windows to let in the air, and anything like a draught was carefully excluded by every exercise of ingenuity. While therefore expressing his thanks to Professor Kerr for having brought this very important subject before the Institute, he submitted that gentleman had not unriddled the difficulty of the problem in the plan and scheme he had brought under their consideration.

Mr. Edwin Nash, Fellow, remarked, that if architects are to solve this problem, it is necessary that architects should accurately know what the problem is. It seems very much to turn upon the question of expense, and the preceding speakers had, he thought, very properly addressed themselves to that consideration. There could be no real difficulty in designing cottages for the poor in the best possible manner, for that point had been gone into very much by many able men of this Institute as well as by others. He had in his humble way attempted to solve the problem in the erection, for a benevolent lady, upon her own freehold land, of twelve cottages of the class called "model." He had taken the plans of Mr. Roberts, and had made what he considered to be improvements upon them. Of the twelve cottages to which he referred, four of them contained three bedchambers, and the remainder only two; and, taking the average of the whole twelve, they cost £200. each, and that was far from the figure which they were endeavouring to arrive at, and he had consequently solved nothing. They were greatly obliged to Professor Kerr for the ready talent of his pen, but he thought that gentleman was somewhat too sanguine. At the same time they were indebted to him for a good many valuable ideas, which, after the clear way in which they had been put before them, might lead to more good than was at first evident.

Mr. JOHN P. SEDDON (Hon. Sec.) called the attention of the meeting to a set of plans of model lodging-houses lately built in St. Ann's Court, Wardour Street, by their Fellow, Mr. Burges, who was not able to attend, but had kindly sent them for the inspection of the meeting; and his assistant (Mr. Chapple), who had had the advantage of obtaining some knowledge of the habits of the poor, who had collected the rents of these houses for a considerable time, and who was present, would be happy to give any information respecting them, bearing on the questions now under discussion—such as their cost, and the amount of return upon the outlay. The ground plan appeared to be occupied by a school-room and kitchen, the first floor by single apartments, and the second floor by dwellings of two rooms. He believed Mr. Chapple would tell them that the single room system was not popular, while the two rooms were much in favour.

Mr. CHAPPLE said the houses were substantially built, and no repairs had been required since they were erected. The two rooms were let for 5s. 6d. per week, and the single rooms for 3s. At one end of the building there were two larger rooms, which were let for 6s. per week, and the tenements were occupied for the most part by those who had lived in them from the first. The single rooms he had difficulty in letting. One objection was that they were small, and another, that the rent was higher in comparison than that of the two rooms. The size of the single rooms was 10 by 10 feet. On the ground floor, at one end of the building, was a school-room, which was let at fifty guineas per annum, and in another part there was a kitchen and scullery. Last year the return was as near as possible 4½ per cent. [The CHAIRMAN: On the cost of the building?] On the whole outlay, including ground-rent, taxes, and every charge.

The CHAIRMAN apprehended the houses referred to were those in St. Ann's Court, Soho, and asked by what class of persons they were for the most part occupied.

Mr. CHAPPLE replied some were tailors, and one was a carman. They were persons who might be supposed to earn from £1. to 25s. per week on the average.

Professor KERR.—How many rooms do you allow for a family of five persons?

Mr. CHAPPLE.—Two rooms.

Professor KERR.—That is no great improvement.

Mr. CHAPPLE explained that each of the two rooms had two cupboards, the bottom of which was used for coal. There was a large central hall with staircase, and two water-closets, sink, and dust-shoot on each floor. The houses were well built with brick outside, and inside the passages were of York stone, supported by rolled iron girders. The total cost of the building was £2,500.

Mr. SEDDON inquired whether the people generally asked for more rooms.

Mr. CHAPPLE replied in the negative, and added, they would probably like larger rooms than 10 by 10 feet, but they objected to pay more rent for them.

Mr. OCTAVIUS HANSARD, Fellow, would call attention to a point which, up to this time, had been somewhat overlooked: that was accommodation for the *very* poorest class of people. He had had some practical experience with property in Bethnal Green, where he believed the very humblest classes of the metropolis resided. He was not referring to model lodging-houses, but to a class of dwellings built for the working classes 150 or 200 years ago, to carry on their trade, as well as for living in, many of which were now inhabited by the very poorest grades of the labouring classes—hucksters, weavers, cabinet-makers, and vendors of cheap goods, and to a great extent, no doubt, by others of less reputable occupations. The rents varied from 2s. 6d. to 1s. 6d. per room per week for single rooms. It was for this class that we should seek for alleviation. He had altered and renovated a great many of these houses, but the great difficulty was to carry out and preserve any improvements. To illustrate this—referring to another district in London, where the inhabitants were of the roughest order—he had, upon the late outbreak of cholera, supplied covers to the water cisterns and butts to some half dozen houses, and fitted them with pipes, ball cocks, and taps; but in a fortnight's time hardly a single ball cock, or tap was left, and in many cases the flaps were taken down and used for firewood. There was no consideration for property among such a class of people; they went on in this respect from bad to worse, and the depredators were beyond the reach of punishment. Reverting to the one-room system, in the locality he spoke of in the first instance that system for the most part prevailed. In some cases the rooms were 12 by 10 feet, and rarely exceeded 13 by 15, let at rents before mentioned. They were not, however, so unhealthy as might be supposed, as the large windows which were originally constructed for the sake of light to the looms of the weavers were generally retained; but where new windows had been inserted, they were larger than the ordinary size, which was a great point in regard to ventilation. He believed the very lowest classes would be glad to avail themselves of the two-room system, but the rent was the difficulty, and they therefore preferred the single room at the lower rent. He did not think they *craved* at all for what had been termed luxuries, as closets, sinks, cupboards, &c.; to improve them was the difficulty, because they wanted education, so to say, in the social refinements and comforts of life. He would, however, say of the poorest and lowest classes of the people, they were always ready and willing to receive advice in the best spirit; and if judiciously and kindly treated, much might be effected in these matters. He agreed with Mr. Chatfield Clarke as to the objections generally entertained against block-buildings on the ground of the heterogeneous admixture of the population, and more particularly of children. With regard to Mr. Kerr's plan, he (Mr. Hansard) had gone into a calculation of the cost, and was of opinion that the rents were nearly twenty per cent. too high, and so beyond the means of the class he had referred to. Supposing the scheme to be an extensive one, it might be carried out, say, by a builder on his own speculation, returning him a fair remuneration upon Mr. Kerr's estimated rental at about £90. per room, and that would be a little below 4d. per cube foot, including the balconies and proportion of staircase.

Mr. ROGER SMITH, Fellow, said they owed their thanks to Professor Kerr, not only for bringing the subject forward, but also for directing attention primarily to principles. There were two separate points in the paper. The more important one was that which related to the principles on which those who wished to improve the dwellings of the poor should proceed: the other one was the particular scheme laid before them. He thought the principles advocated by the preceding speaker of providing accommodation for the class of poor who were below the class who ordinarily lived in "model" dwellings was a most important one. In the superior buildings erected by Miss Coutts and various societies for the improvement of the condition of the dwellings of the working classes, excellent accommodation was provided, which was duly appreciated by the superior class of artisans, &c.; but the *very poor*, those whose condition was extremely bad in consequence of the poorness of their dwellings, and the limited amount of accommodation in them, were not touched at all by such plans as those. He thought providing accommodation for families in the shape of one room only was open to grave objections; and that for families, two-roomed tenements ought to be held to be the smallest which should be provided; but at the same time our errors, he considered, had been hitherto chiefly on the side of excess, *i. e.* building tenements of three and four rooms rather than two: so that it was perhaps matter of congratulation that a plan providing accommodation below the average was forced upon their attention. There could be no doubt whatever that a large number of cases amongst the very poor would be met by single-room accommodation; but in more cases he thought by two rooms. The true course, he believed, was to provide, as an average, sets of two rooms, some of three; and at present, at least a large number of single rooms: but since many large blocks of three and four roomed tenements had already been built, the greatest good might perhaps be done at the present time by building one-roomed tenements. He thought some of the data laid before them by Professor Kerr were open to the objection that, whereas he had afforded them information as to what was found to be the case of poor families, both as to the number of rooms and beds they occupied, he had left them to infer—and Professor Kerr himself inferred it—that they had as much room as they wished for, and as many beds as the requirements of health and decency called for. If there were not room for improvement, they would scarcely be here discussing the question; therefore, the present condition of the very poor must not be taken as that condition which improvers looked upon as ultimate, but rather as the thing they should endeavour to ameliorate. They should give the poor the means of getting something better than that which they now have. With regard to the plan that had been laid before them, he expressed his regret—a regret which was shared by others—that Professor Kerr had thought it unnecessary in his paper "to trouble the meeting, as he said, with the details of his estimates." The gist of the usefulness of the project was very much in the estimate, and it was desirable to have it before them in all its details. He (Mr. R. Smith) had cubed up the contents, and allowing for a share of the foundations, staircase and closets, and adding an amount for the balconies at front and back, and pricing the portion which was cubed at $4\frac{1}{2}$d. per cubic foot, he brought the cost of each room to £98. He thought, therefore, that Professor Kerr's estimate should be increased 25 per cent. before it reached a safe datum. That was a misfortune, because it not only destroyed some of the value of an ingenious device, but because it favoured the reproach cast upon architects, that their estimates were not reliable. He hoped Professor Kerr would be able to satisfy them as to the correctness of his figures, taking the present prices of materials and labour; and he for one should be very glad to find that this plan could be carried out for the sum stated. He ventured to suggest, without materially altering the design in other respects, that an improvement would be made by carrying the half-brick partition shown on the plan, right through the tenement, and making it a two-roomed tenement instead of one. If, at the same time, the depth were reduced from 20 feet to 15 feet, and the width increased to 22 feet, the area would not be increased, but a better arrangement could be got, because the wall would effect the complete separation, which they all considered to be so desirable, between the rooms of the house. He agreed that they ought to have as few luxuries and accessories as possible, as he had had experience proving how liable such articles are to damage, even under the eye of a superintendent or bailiff; and where supervision was impossible, the state of things in that respect would, of course, be much worse.

Mr. C. F. Hayward (Hon. Sec.) was glad that his friend Mr. Roger Smith had pointed out that Prof. Kerr had been very careful to divide his paper into the distinct parts he had referred to. After having discussed very fully the principles on which they should proceed, Prof. Kerr produced his plan, and was careful to say he by no means wished it to be considered the best way of carrying out the principles he advocated, adding, as a reason for producing a plan at all, that those who had such principles to advocate ought to be prepared with some plan to discuss. It was due to Prof. Kerr to say thus much, because a good deal of the discussion was upon this particular plan, which the author was not himself prepared fully to abide by. He had almost hoped that Prof. Kerr would have been provided this evening with a *revised plan* in respect of some of the details which, a fortnight ago, he confessed were hardly quite what he wished; at the same time, he deserved an immense amount of credit for having ably gone into the question boldly against all set notions, and the array of philanthropic societies and individuals, who had, for a length of time, alone carried this matter out practically—much to their honour be it spoken—though hardly so successfully perhaps as they themselves had hoped. This was because (he agreed with others in thinking) philanthropy had aimed too high to meet the great mass of the evil. Many good persons had imported so much of charitable feeling into this *really* business question, that any large block of buildings to be inhabited by the working classes was sure to be called "model;" and as such was avoided by a certain class of people, who not only could not afford the prices charged, but who objected to the necessary restraints put upon them personally. This was unfortunate, because these buildings need not necessarily be upon any so-called "model" plan at all, but on a plan which, if the circumstances of the case warranted it, might be adopted so generally that the word would not apply. Therefore he thought Prof. Kerr's plan was valuable, though he agreed with his friends who had preceded him, that it was open to immense objection. For instance, he (Mr. Hayward) did not think it was desirable to *encourage* families in the habit of living together in one room: but he thought the same space occupied by the one room of this plan, or its half-partition, or even less, perhaps, divided into two apartments, would be preferable. He admitted that Prof. Kerr's arguments on this point were very strong, and they had been used cogently with regard to model cottages in the country, but they applied with greater force to towns—viz. that the female head of the family had to attend to a great many home duties, and to look after her family at the same time, and for that reason it was desirable that she should be able to cast her view all round the dwelling. In addition to this, it might be of importance to have only one room to furnish and to keep clean instead of two, where all the household work had to be done by one pair of hands, with, perhaps, occasional duties to attend to out of doors. At the same time the plan before them was liable to the objection of being a little too luxurious in space, while it was intended to be the other way in fittings, &c. For his own part he should be inclined to substitute one or two of those conveniences, which were thrown over as being complicated and expensive. He agreed with other speakers as to the difficulty there was in introducing anything, even so slightly complicated, or such a simple piece of machinery as a water-closet, or a common sink trap, with the hope that it would be kept in decent order for any length of time, but still he thought people might be educated to those matters, and it was bad policy to say, because some of these accessories of comfort were liable to derangement, they should not endeavour to introduce more simple appliances which would serve the purposes. For instance, Professor Kerr objected to the common sink, and arranged a way of getting rid of the waste water independently of it. He (Mr. Hayward) thought no houses ought to be built for the poor classes without a proper sink, for all could and should be equally educated to the care and use of such a convenience as that. He thought anybody who proposed a plan of this kind was bound not to throw over these little things, but to meet the difficulty, and endeavour to get the people who inhabited these houses to overcome their prejudices. Professor Kerr had referred to the domestic arrangements of our forefathers, when in olden times they had not any of those thousand and one conveniences we now deem necessaries of decent life. As these things were gradually introduced, all classes became accustomed to them except those we are speaking of, the very last in the scale of social existence. Those who travelled abroad found, even now, that many articles in use amongst ourselves were not there considered necessary, and, if occasionally found, were very liable to get out of order from improper use. Therefore he thought *progress* ought to have some place in their minds when they were discussing improved dwellings for the poor, and no propositions ought merely to take the poor "as they are." The word "improved" did not appear in the title of the paper, but it ought certainly to be added, because *improvement* was the object of the whole discussion, and, in all attempts to provide dwellings for the poor, *improvement* was understood, and ought not to be severed from them; and it was evidently Professor Kerr's idea to show great improvement upon what we have now. He would refer to one point which struck him as extraordinary when speaking of the difficulty of obtaining sites in London, and hearing gentlemen preparing plans for getting courts and groups of small houses, and remodelling them; and that was the immense quantity, even to the extent of square miles of ground, covered with most absurdly low houses for a city like London—houses which it would repay to pull down for the sake of the ground, and rebuild as a moderate class of improved dwellings (not to be called "model" houses). If a large company, for instance, obtained the sites of streets thus occupied at the present time, houses of four storeys could be built upon them instead of the present two-story hovels, and the amount of accommodation would be doubled as well as improved in each locality operated upon. It seemed unnecessary to go to the expense of establishing suburban villages, with the extra cost of railway travelling to and from the metropolis each day, when so much ground in London was occupied by houses of little value in themselves; but the land on which they stood would be greatly enhanced in value if larger and better buildings could be placed upon it, which could be made to embrace the requirements, in point of extent of accommodation, of every grade of the working classes. He thought the difficulty of site could in this way be met to a great extent. Let the details of the buildings be simplified to any extent consistent with decency, but let them not seek to multiply those extremely pretty, and, he had almost said useless, structures which were to be seen in many parts of London. He ventured to think that large model buildings had to a certain extent defeated their own object, while effecting perhaps as important a one in other ways, though he would be the last to appear to throw cold water upon the grand efforts which had been made in this direction. If anything came out of this discussion, Professor Kerr would deserve great credit for having brought the subject practically before a body of men who ought to deal with it in a practical, and not in a merely sentimental manner.

Mr. Passmore Edwards would not have risen at that hour, had it not been that almost every speaker had said something, more or less, against sentiment and philanthropy in connection with this subject. He had a word to say in favour of them. If they took sentiment out of all human concerns, it would be like taking the sunlight from the material world. Sentiment had to do with even the commercial life of England. Supposing the Atlantic cable should not pay an immense profit to the shareholders, it would have brought America so much nearer to England, and thereby assisted to establish a better understanding between the two peoples. Supposing, again, the projected submarine tunnel between England and France were made, and did not pay a large profit to those who undertook it, it would bring France into more intimate connexion with us, and might therefore be a means of preventing disastrous wars. Noblemen and gentlemen of fortune cultivated waste lands to some extent from philanthropic motives. They might not make large per-centages, but they reflected that in such operations they gave employment to a large number of the labouring population. He said that philanthropy had to do with this matter, and had already done much. It had done more in the country than in London. The Dukes of Northumberland, Devonshire, and Buccleuch, and others, had built not merely hundreds, but he might say thousands, of houses for the labouring classes; and they had put feeling into the work, on the ground that if they got a return of only 2 or 3 per cent. for these improved dwellings, it was better than getting 5 per cent. from a demoralizing system of habitations for the poor. Mr. Titus Salt, Sir T. Crossley, and others who had worked in the same direction, on a very large scale, had been governed by similar motives, and he was satisfied if it were not for the exercise of those virtues, that bad as we are in London now, we should have been a great deal worse. The Peabodys, the Couttses, the Morleys, and the Waterlows, deserved the thanks of the country for what they had done; and as pioneers of this movement, they were animated by benevolent motives. He was therefore surprised when he heard Mr. Spencer-Bell, whose life was characterised by works of philanthropy, take up the position that this matter of providing accommodation for the very poor, must rest altogether upon a commercial basis. Perhaps, it must in future more than it has hitherto; but we should be thankful to those who had already done so much in this great work. He had been informed that the charter of some of the societies for providing improved dwellings, restricted the shareholders from receiving more than £5. per cent. upon their outlay. He was much struck with one circumstance in the paper, in which Professor Kerr appeared to regard the people of England in the light of a Chinese community, and that our civilization was of such a stereotyped character, that as we are, so we might remain for ever. Now, if there was one thing that struck them more than another in the present day, it was, he would not say exactly *progress*,—but *movement*. Where a great evil existed, men were always to be found to battle with it. Where intemperance and ignorance predominated, men banded together to destroy them. This longing for something better was peculiarly characteristic of the English nation; but Professor Kerr argued as if the world were at a stand-still and incapable of further progress. They had been told by the Professor that a very large per-centage of the labouring classes in London preferred to live in one room only. Others told them that the provision hitherto made consisted, for the most part, of two rooms, and that these were most generally appreciated. His own impression was, that there was a strong desire on the part of the labouring class to have more extended living accommodation, and, if they were provided with two rooms at little more rent than was now paid for one room, the two rooms would be greatly preferred. He thought it right that the great impulse of philanthropy which had done so much in the past should not be altogether trodden under foot in such a discussion as this.

Mr. W. H. Robinson (Secretary to the Operatives' House Building Company) said, being connected with a practical attempt to improve the dwellings of the working classes, he would remark, that all who were interested in this subject would congratulate themselves on its having been taken up by practical architects, inasmuch as the most important element in the question was the cheapest and best kind of planning and building. After all sentiment, the question in this as in other things was, "Will it pay?" for if improved dwellings would not pay commercially, they would never get millions of money invested in their erection. Philanthropy had exerted itself between twenty and thirty years in this work and had only just reached the outside of the evil without reaching the core. He thought one great mistake very generally made in this matter was, that they jumped too hastily to conclusions. When his attention was first called to this subject, he studied by himself all he could get hold of, written or printed, with respect to dwellings' improvement, paying particular attention to the most economical and convenient method of planning and construction, and having done that, he submitted the result of his studies first to the persons most interested—the working men themselves. There were two large meetings of working men held in Lambeth, at the first of which they selected a number of their own body to examine the plans prepared under the sanction of Mr. Samuel Sharpe, the architect, a gentleman who had received two of the earliest medals of this Institute. These plans, having received their approval, had been accepted by a second meeting, attended by about 2500 working men, in last February, and might fairly be taken as representing what the working men considered desirable to be erected for themselves. He was not provided with them at this moment, but he might state generally, that they were a modification of Mr. Roberts's design for the Prince Consort's models erected in Hyde Park in 1851, and were capable of being adapted for occupation in single, two, three, four or more roomed tenements. The company he represented was formed to carry out these plans, upon commercial, not *merely* philanthropic principles, and he was sure that such buildings might well be made to pay a fair commercial dividend. To come, however, to the experience of the philanthropic societies, that is, those who did not look principally to the making a profit, there were three such building associations which at the present time held a prominent position. These were, first—The Metropolitan Association for Improving the Dwellings of the Industrious Classes, established in 1845, whose first buildings were erected in Pancras Square about 1848; next, The Labourers' Friend Society, under the presidency of the Earl of Shaftesbury; and the other was The Marylebone Association. These were all established at a time when they had not the advantage of associating under limited liability, and, as a condition of their charter, their profits were limited to £5. per cent. Now, it was not fair to take the results of associations who were compelled to limit their profits in that way as being an indication that no society could make a higher return. Under such circumstances it was not probable that the instructions to the architect would be to cut the thing so closely as would be the case if the sole object was to make a good commercial profit. He would ask those present to examine the plans of the buildings of these associations, not of any selected portion, but of the whole buildings, and he thought they would see that very often much space was lost, and they might in most cases have been erected cheaper, and yet have been quite as substantial, healthful and comfortable, had every advantage been taken to make a good commercial dividend. At any rate these were the conclusions he had come to on the matter. He thought they might be better planned and be made to pay more. Then it was to be remarked, that the general accounts of these associations were mixed up with other things than the erection of family dwellings. They erected and furnished rooms for single persons, baths and washhouses were provided, old houses were taken and renovated, and he considered all these things ought to be eliminated before they attemped to form a judgment on the experience of these societies as to the remunerative character of new buildings. They should confine their attention to the building of family dwellings and nothing else. Mr. Gatliff, the Secretary of the Metropolitan Association, had stated, in a discussion at the Society of Arts, in June, 1864, that the family dwellings of that Association have a return, upon the average, of 5 per cent., and that more recently erected family dwellings had paid upwards of 6 per cent. He had in his hand the report issued by a committee of the Society of Arts, which contained a tabular statement of the receipts of these several societies, collected by Mr. Thomas Twining; and those who wished to study this subject would find in that gentleman's Economic Museum at Twickenham an unparalleled collection of plans, suggested and executed in this as well as foreign countries, for improving the dwellings of the poor. He would remark that, in his opinion, most of the tenements of these associations were let below their value. On inquiry, he had recently ascertained that moderately respectable tenements of two rooms in Westminster were now easily to be let for as much as 7s. 6d. per week. At a lower rent than the market rate they could not expect to pay the market rate of dividend. The great mistake of the philanthropists was building expensively and letting at low rents. The Metropolitan Association, in 1864, made $3\frac{3}{10}$ per cent. on one block of buildings costing £11,365. Another block paid $5\frac{1}{3}$ per cent. on £6,731.; another block paid $6\frac{3}{4}$ per cent. on £2,381.; another 4 per cent. on £9,852.; another paid $4\frac{5}{8}$ per cent. on £23,051.; and another paid $5\frac{1}{2}$ per cent. on £18,306. Last year the rents were raised nearer to the market value, though still somewhat below it, and these buildings paid a better per-centage, the average of the whole being rather more than $5\frac{1}{3}$ per cent. The Labourers' Friend Society had but one block of buildings erected expressly for family occupation, which in 1862 paid $4\frac{3}{5}$ per cent.; in 1863, 5 per cent.; in 1864, $5\frac{1}{7}$ per cent.; and in 1865, $4\frac{3}{5}$ per cent. But these were philanthropic results, and he had already remarked that they ought to form their judgment only upon the results of commercial associations. What did Mr. Alderman Waterlow say? He had expended on houses containing 202 separate tenements, some of which were of four rooms and some three, a sum of £30,000. It was easy to calculate what those houses must be let at to pay 7 per cent.

The average return had been 8 per cent. of rental on the whole expenditure, as would be seen in a tabular statement contained in Mr. Hole's recent valuable book on "The Dwellings of the Working Classes." He (Mr. Robinson) did not think they ought to assume, after that, that dwellings for the working classes would not pay commercially. He thought better might be done in future than had been done in the past. To avoid tortuous passages, and to afford the utmost amount of space for dwelling-rooms and offices, with the smallest amount of passages and staircase, providing for plenty of both air and light, was the problem which had been considered in devising the plans which he hoped to see executed by the company he represented. If that plan were submitted, he thought it would meet with the approval of those who understood the matter. They might also hope for more in the way of improvement by the use of other materials. Mr. Edwin Chadwick had laid before the meeting of the Social Science Congress at Manchester a suggestion for the use of concrete, which was used very largely in France, and the result was a very great diminution of expenditure. Then, again, there was iron. He was not himself qualified to pronounce an opinion on this subject, but it was worth consideration. Then, as to providing for the very lowest classes, they *must* always be objects of charity. They could not expect, out of their wants and necessities, to make a profit. If they were to be provided for, it must be by the Couttses and Peabodys. If the proposed bill of Mr. Torrens should pass for the parochial erection of dwellings, its operation should be limited to those of the very poorest classes—not for the artisan in the receipt of good wages, who could afford to pay a fair rent, and had no objection to do so. With respect to single-room tenements, he had seen the plan of Mr. Roberts and others for one-room and two-room tenements, but he considered the appliances were of too costly a kind. In the case of Miss Cooper's houses at Westminster—the most recent of the improved class of dwellings—a large outlay had been incurred in the erection of a co-operative store and working men's club-room; and it was because such buildings as these did not pay, that the idea had got abroad that such investments could not be made profitable.

Professor KERR, being called upon, said:—I should be glad to be permitted to offer a few observations; not that it is necessary, even if my ideas had been more controverted than they have been, to enter upon any defence,—for I have come before this meeting with no sort of personal object to sustain,—but simply because there are explanations to be given in reply to debate. And I may premise that I have not only listened very attentively to what has been said here to-night, but I have paid due attention to what has appeared in the professional newspapers with regard to the lecture by means of which I introduced the subject; and I think that I ought to go through the chief points that have been made, and then leave it to the individual judgment of members of the Institute to make of what service they may the results of the whole discussion. That is my only object.

Now let it be observed that I have asked three questions:—*First.* Whether the dogmatic plan of the model lodging house suits the poor? *Secondly.* If this be not so, what other principle ought to be adopted? and, *Thirdly.* As an experiment, and only as an experiment, how far is the design which I submit to you of any value?

With regard to the first question, namely, what I call the "dogmatic" model (and I use the term "dogmatic," of course, in its merely scientific sense, as referring to something to be accepted without special argument), I may say that for twenty-five or thirty years the improvement of the dwellings of the labouring classes has gone steadily forward in one direction, and only one; and it is not to be wondered at if it proves to be the fact, that in going on so long in one direction the excellent promoters of the scheme have over-reached their purpose. This is by no means an unusual thing; and the question is whether a crisis in this course of the enterprise has not now arrived? I think it has; and so apparently do gentlemen of great intelligence who have spoken to-night. It is remarkable that the dogmatic model plan has not been defended by any one of the speakers. It is not maintained in its integrity by any gentleman present. Therefore I must express my astonishment when I find the chief of our professional organs not only supporting it in its entirety, but paying me the great compliment of saying, that if the present opposition had not been brought forward by myself, it would not have considered it necessary to do more than dismiss it with a dozen lines of disapproval. I think it is to be regretted when we find sentimentality so far misleading an important and honoured organ of public opinion. But it is not to be wondered at either; for when one has been accustomed with unimpeachable motives to run in a particular groove for a quarter of a century, the convictions of habitual thought are not easily to be shaken.

My definition of what I call "the poor" has been objected to, not as regards merely the application of a term, but positively as regards the existence of a class. I have selected that class of working people who as a rule occupy tenements of one room, chiefly because of their earning small wages; and I call these the respectable poor, and ask you to design a dwelling more suitable than this for their special wants. But as it seems to me one writer is disposed to deny that such a class exists, and to say that there is no intervening stratum of society between what he calls the working man—the gentleman who makes political "demonstrations" in the streets and parks, and exercises his influence in trades' unions —and the depraved classes who occupy the desolate abodes described by my friend Mr. Hansard. But I undertake to represent a class between those too—equally respectable with the one, and a great deal more so than the other—a class which requires our scientific help more than the former, and deserves it more than the latter. And I say that such a class not only exists, but is the very class that calls for this debate.

A singular argument has been used; it has not been advanced to-night, but it is important you should hear it,—for the name of Mr. Alderman Waterlow is attached to it; he mentioned it in reply to me in private conversation; "You must bear in mind," said that gentleman, "granting that the model dwellings are occupied by a superior class, that the fact of our building accommodation for them makes more room in the old way for the inferior classes." Now, how any gentleman, who appreciates the merits of the question, can console himself with that argument I cannot understand. Take all the model lodging houses throughout London, erected within the last five-and-twenty years, and they are only a mere drop in the bucket compared with the ordinary progress of population; and what room, therefore, can they have made for anything?

My statistics have been a good deal quoted, and they have been disputed. I must ask leave to explain. I thought I had made it understood when I spoke of the St. George's Hanover Square statistics, that I was not taking them in that careless way which some of my friends seem to suppose. I distinctly said that I used them because I considered, and because I believed others also would, on reflection, consider, these statistics to be on the whole a fair criterion for our purpose. Take, on the other hand, the figures of *The Builder*; they are given in such a way as to make it appear to a casual reader that I was very far wrong indeed. But what is their real result? Merely this,—that while the St. George's poor possess $1\frac{3}{4}$ beds per family, the poor of St. Margaret's Westminster possess $1\frac{1}{2}$ beds per family. There is, therefore, only a slight fraction of difference; which, in fact, supports the truth of my inference, because of the simple fact that the poor in Westminster are worse off than the poor in St. George's. I repeat, that when I took these figures as they stood, without any romance or sentiment, and without making any allowances whatever, it was because I found that they produced as nearly as possible the very results which I had previously obtained from other calculations. In a word, I consider the result of my reasoning on this house-to-house visitation in St. George's, to prove in a very satisfactory way that there is a great class, and I say it is the class of poor labourers and their compeers, intelligent, honest, simple people, content with little so long as they can pay their way, who are usually content to live in single rooms. I take that as a matter of fact,—I do not speak of it as a matter of credit or of discredit to them,—I only say as a fact they are content to occupy single rooms; and why should I not be permitted to state that simple fact, and act upon it? But with regard to these statistics altogether I have this to say—If there is any question about their accuracy and their application, it is a very easy thing to collect special statistics for the occasion. Nothing may be more disputed than the application of statistics to collateral issues; but nothing can be more indisputable than the application of statistical enquiry to a direct issue. I say, therefore, collect for yourselves statistics for this purpose, and I venture to predict that you will find the truth to be very nearly as I have put it; namely, that taking the various classes of poor persons who occupy lodgings of one room, not because of their poverty alone, but because of smallness of family, you will find that that class amounts in round numbers to 50 per cent. of the entire body of persons whom I have brought under your notice as the great class of poor labouring people. If that turns out to be so, then my statistics and my application of them are right.

It is not denied, I am happy to find, in this meeting, that the model dwellings are not houses for the poor. I have distinctly and anxiously directed attention to this issue, and I believe I may say the universal opinion which has been expressed here is, that these buildings do not, as a fact, house the poor. Then if there be a "stationary policy" in this matter (and this term has been used against me in grave reproach), surely the stationary policy does not belong to me, but to those who defend the existing system, which, in spite of so much endeavour, does not house the poor. My purpose is to house the poor. My argument is good for nothing unless it will tend to this end; and the chief point which I press is, that the poor ought to be allowed to say for themselves, as the best judges of their own affairs, what it is they really want. I have, myself, come across singular illustrations of the absurdity of the most simple of our more advanced appliances and conveniences when forced upon those who do not happen to want them; and I would deprecate, in a discussion of this kind, the introduction of terms which cast discredit upon the poor for not desiring such appliances and conveniences. We must allow them in principle to lodge themselves in their own way. If we desire to better their condition,—to give them a higher ideal of domestic life, let us take direct means to do so. Let us not merely force upon them formulæ of plan and trifles of supposed convenience. My friend, Professor Donaldson, was telling me to-day of a case in point. He once went with the late Lord Palmerston over some of that nobleman's property in Ireland, to inspect the labourers' cottages. Now, Lord Palmerston was not what we should call a very sentimental man; but, desiring to make his people as comfortable as possible, he went on suggesting a closet here and a cupboard there with great freedom, until at last a good woman, dropping a low curtsey, said "True for your honour, and they would be mighty convenient, but we've nothing to put in them!" And Lord Palmerston being a man of sound sense, admitted the force of the argument, and enjoyed the joke. The poor possess very little; and appliances are perfectly useless unless possessions correspond. Simple folk, simple dwellings. It comes, then, to be a question whether the good cause before us is not suffering under the misfortune of an actual mis-direction of the funds contributed for its admirable purposes, by the almost unexampled generosity of various philanthropic persons. For when Mr. Peabody lays down his hundreds of thousands, and Miss Coutts and others display almost equal profusion in their liberality, they take no responsibility upon themselves as to the mode in which their money is to be laid out. They say, in effect, "Here are the overflowings of God's bounty to ourselves; our purpose is to house the poor who need housing so much; and we look to you who profess to understand the subject, to see that these funds are dispensed for the real benefit of the class in whose behalf you so deeply excite our sympathy." If, therefore, for reasons which amount to mere crotchets, these funds are made to miss that mark, I venture to say there is a very serious responsibility resting somewhere.

I now come to the second question, viz.:—If this be as I state, what principle ought to be adopted to provide, in a suitable form, the required accommodation for the poor? I have suggested the single room principle. Let me point out the great error which some gentlemen persist in making in regard to this. They seem to think that because I have used the term "single room" accommodation, I am to be reproached as a person desirous of perpetuating a debased state of society,—a state of living elegantly described in a professional print as "pigging together in one room!" Those who know my particular form of sentimentalism, will acknowledge that I am not likely to defend the perpetuation of anything of the sort. My purpose is not to *restrict* the accommodation of the poor, but to *enlarge* it; and to find a means of doing so without (as our President put it the other night) taxing their pockets too much. My single room accommodation is merely the principle. That plan which I laid before you is not one room in the sense of a little two-pair back about 12 feet by 8, with a fire-place and a shelf. It is the principle of single room accommodation, refined as much as I could refine it, and contrived to embrace as much as it could be made to embrace in perfect simplicity and perfect cheapness. Even if I recommended this plan for the whole population of this class (which I do not), my single room principle is not a room in a house as in the present system, but a house in a room; and I recommend this principle of single room accommodation, not for its defects, but for its simplicity. If it be incapable of being made to embrace enough, discard it and try again; but if it be capable of being made to embrace all that the poor really wish, then I say it looks very like a solution of the problem in one particular direction. For, bear in mind, that I have always said—This is a great problem; one to be solved in detail. It is not a question to be solved by an individual expert, sitting down to make an individual design. This of mine is only one attempt to solve it in one way. I have no objection to people building as many model suites of rooms as they like; but I say to them do not confine yourselves entirely to those suites of rooms,—and I say more, that if single rooms are built upon a good and comprehensive plan, they will be more useful to the poor, and will let more readily amongst that class than those suites of rooms; because it is a radical essence of this system of mine—that it gives in reality two or three rooms in the one room, and at the one rent, as necessity requires. It is admitted, for instance, by the writer in the *Builder* (who evidently well understands the subject), that single rooms in some number or other ought to be provided. Now, that admission is all I ask for. I do not say we are to provide nothing but single rooms. It is a question of mere statistics, what proportion they should bear in number to the larger tenements. I should like to ask any gentleman acquainted with the making of the model dwellings system, how much underletting there is going on in these suites of rooms?

Mr. ROBINSON believed very little, if any.

Professor KERR. I have understood from Mr. Alderman Waterlow that there is a good deal; and if so, surely that strikes at the very root of the principle which is involved in the model plans.

Mr. ALLEN (attending on behalf of Mr. Alderman Waterlow) said it was a great rarity for the rooms to be underlet. Indeed, at Highgate a large number of single rooms were being provided, and they were now adopting generally the plan of two rooms.

Professor KERR considered this confirmatory of his ideas. The question must next be taken up in this form—Is it desirable to house the poor on their own terms as to rent? If they are to pay more rent than at present, then you must give them a larger amount of wages, which is more easily said than done. The working man at the present time often pays 4*s*. out of 20*s*. a week for rent, equal to 20 per cent., and if you call upon him to do more, you forget that the acknowledged standard for the middle classes is 10 per cent. for rent.

The CHAIRMAN suggested that at the late hour to which the proceedings had extended, as Professor Kerr had not arrived at the end of his reply, and it being evident also that other gentlemen were desirous of speaking on the subject, it would be better to adjourn the discussion, probably to the next meeting after the Christmas recess; and after a short conversation that course was agreed to, and the meeting adjourned till Monday, 14th January, 1867.

DISCUSSION ON PROFESSOR KERR'S PAPER—"ON THE PROBLEM OF PROVIDING DWELLINGS FOR THE POOR."

At the Ordinary General Meeting of the Royal Institute of British Architects, 14th of January, 1867.

AFTER some preliminary remarks by the PRESIDENT—

Mr. W. H. ROBINSON, said it might be convenient before pursuing this subject further, to recall to mind the chief points of Professor Kerr's paper, as he understood it, viz.: 1,—That buildings for the labouring classes are not commercially remunerative; 2,—That the accommodation for the artizan class is not complained of by themselves, and is, upon the whole, a satisfactory one. 3,—That the position of the poor (properly so called) is far inferior, 63½ per cent. occupying only single rooms, and among this class a very small proportion require three beds, and of the rest only half want two beds, the remainder being content with one. The so-called "dogma" requiring *three* bed rooms was then complained of, and the building of single rooms advocated.

On the point that the artizan class do not complain of the present accommodation, he would remark that if they had waited for people who are subjected to inconveniences to complain of them, many of the inconveniences of society would never have been removed; and if they had waited for the members of uncivilized society to ask to be civilized, there would have been no missionaries of civilization. He therefore did not think the fact of the artizans not complaining of the accommodation was a sufficient reason for discouraging attempts to improve that accommodation. If they took the cases mentioned of the better artizan class living in houses of six or eight rooms, they would find that those houses were invariably built for the accommodation of one family. The houses now occupied by artizans in apartments in dense neighbourhoods were all so built originally, and were formerly actually occupied by single families of a rather higher social grade, while those now being built in the environs of London, were built as though they were intended to be occupied by one family. [Professor KERR.—That is a mistake,—a radical mistake.] He did not think he was mistaken. The only exception he knew of, in houses of ordinary size, was to be found in some houses built on the Prince of Wales's estate, near Vauxhall Bridge, which were arranged for the accommodation of several families. These houses were pointed out to him as exceptional, and exceptions were usually taken to prove a general rule. That the ordinary houses were for the most part very unsuited for the occupation of several families might be inferred from a general consideration of their plan. Those houses consisted of basement, ground, first, second, and third floors—sometimes. The basement was generally the only portion fitted with the proper means for cooking; the parlours were small rooms, usually fitted with dwarf cupboards and small grates, adapted only for sitting rooms; the first floor partook more or less of the drawing room character, with perhaps marble chimney pieces; and the floor above, built and fitted as bed rooms, were even more unsuited to the proper performance of the domestic duties of a family. The inconveniences in this respect increased the higher they went up. Such was the ordinary accommodation of well-to-do artizans. There were no conveniences for getting clear water up stairs, and removing dirty water to down stairs,—a task which usually fell to the artizan himself, when he returned home from his day's work; and on one day of the week, certainly for the greater part of the year, he had to submit to the inconvenience of a vapour bath, from wet linen hung in the room to dry. Such was the ordinary state of life of the artizan class. The conveniences for cooking were extremely limited, and when they considered how necessary to a man's health that his food should be wholesomely cooked, and his means economised as much as possible, they must feel the importance of providing proper accommodation. He did not think those people ought to be called Quixotic, who attempted to give the artizan class places to live in, where their wives could perform the multifarious offices of domestic life without so much labour as they usually entailed. In the next place he would refer to what was called the "three bed-room dogma." After looking very anxiously for it, he had not been able to find the "three bed-room dogma." He knew Lord Shaftesbury stated at the Social Science Meeting, that for a model state of society there should be a bed room for the parents, and rooms for each of the sexes of children, and he thought no one would say that was not a state of society *desirable* to be obtained; but as to its being a "*dogma*," in a scientific or other sense of the word, he repeated he had sought for any exemplification of it in vain. Amongst the buildings erected by the gentlemen who were supposed to hold the dogma, some plans prepared by Mr. Henry Roberts, and approved by the Prince Consort, were constructed upon that model, as examples of what was desirable in 1851, but, as far as he could ascertain, the example had not been followed in this respect. The great majority of the houses contained two bed rooms—not three, and with respect to the accommodation actually provided by the various associations, he found, without professing to be accurate to a unit, the result to be as follows:—

Table of Accommodation in Improved or "Model" Buildings specially erected for Families in London.

<table>
<tr><th rowspan="2"></th><th colspan="4">Number of Tenements, consisting of</th><th rowspan="2"></th></tr>
<tr><th>One Room.</th><th>Two Rooms.</th><th>Three Rooms.</th><th>Four Rooms.</th></tr>
<tr><td>*Metropolitan Association.*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Pancras Square</td><td>...</td><td>20</td><td>90</td><td>...</td><td></td></tr>
<tr><td>Albert Street</td><td>...</td><td>18</td><td>42</td><td>...</td><td></td></tr>
<tr><td>Ingestre Buildings</td><td>...</td><td>12</td><td>48</td><td>...</td><td></td></tr>
<tr><td>Nelson Square</td><td>...</td><td>...</td><td>108</td><td>...</td><td></td></tr>
<tr><td>Albert Cottages</td><td>...</td><td>...</td><td>33</td><td>...</td><td></td></tr>
<tr><td>Gatliff Buildings, now erecting on the Marquis of Westminster's estate.</td><td>29</td><td>102</td><td>18</td><td>...</td><td></td></tr>
<tr><td>*Society for Improving the Condition of the Labouring Classes.*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Thanksgiving Buildings</td><td>128</td><td>...</td><td>12</td><td>...</td><td></td></tr>
<tr><td>Streatham Street</td><td>...</td><td>23</td><td>31</td><td>...</td><td></td></tr>
<tr><td>*Marylebone Association.*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Christchurch Buildings</td><td colspan="2">31</td><td>...</td><td>...</td><td></td></tr>
<tr><td>Stafford Buildings</td><td>...</td><td>19</td><td>...</td><td>...</td><td></td></tr>
<tr><td>Lisson Buildings</td><td>28</td><td>...</td><td>...</td><td>...</td><td>Each of these single rooms is furnished with a recess or bed closet.</td></tr>
<tr><td>*Strand Buildings Company.*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Eagle Court</td><td>...</td><td>38</td><td>...</td><td>...</td><td></td></tr>
<tr><td>*Improved Industrial Dwellings Company.*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Cromwell Buildings</td><td>...</td><td>11</td><td>11</td><td>...</td><td></td></tr>
<tr><td>Tower Buildings</td><td>...</td><td>30</td><td>30</td><td>...</td><td></td></tr>
<tr><td>Cobden Buildings</td><td>...</td><td>10</td><td>8</td><td>...</td><td></td></tr>
<tr><td>Stanley Buildings</td><td>..</td><td>50</td><td>50</td><td>...</td><td></td></tr>
<tr><td>Palmerston Buildings</td><td>...</td><td>36</td><td>36</td><td>...</td><td></td></tr>
<tr><td>*City of London Corporation.*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Farringdon Road</td><td>...</td><td>84</td><td>84</td><td>...</td><td></td></tr>
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	Number of Tenements, consisting of				
	One Room.	Two Rooms.	Three Rooms.	Four Rooms.	
Peabody Trustees.					
Commercial Street, Islington ...	...	...	...	...	The statistics of these buildings are not at hand, but they are erected upon the same plan as Columbia Square and Rochester Buildings, and let in the same manner.
Columbia Square, erected by *Miss Burdett Coutts.*	...	...	...	...	Contains 390 rooms, let out in 183 tenements of 1, 2, and 3 rooms each.
Rochester Buildings, erected by *Wm. Gibbs, Esq.*	...	...	...	...	168 tenements, of 1, 2, and 3 rooms each.
W. E. Hilliard, Esq.					
Near Shadwell Station	...	...	112	...	These houses are built professedly after the Prince Consort's model, but modified so as to provide only *two* bed rooms.
Mr. John Newson, Builder.					
Grosvenor Mews, Hanover Square.	...	32	...	...	
Bull Head Court, Snow Hill......	...	24	...	...	
Bull Inn Chambers, Holborn ...	...	35	...	...	
Grosvenor Market, Hanover Square.	...	6	...	...	
Mr. Alderman Waterlow.					
Langbourn Buildings	...	40	40	...	

In this list renovated buildings are not included, nor are those specially designed for single men. Had they been included we could have shown a much larger amount of single room accommodation now actually provided, but it is remarkable that there are no buildings whatever providing *three* bed rooms. With respect to the remunerative character of these dwellings, that was a point on which he was particularly interested, and they all ought to be so, because unless these buildings were made commercially remunerative he was quite sure they would never be erected in sufficient quantity. Benevolence had had its run in this direction for twenty years, and had not succeeded in doing more than touching the outside. The report of the Committee of the Society of Arts, which had been quoted by Professor Kerr upon this subject, was certainly made in 1864, and according to that report the returns were not sufficiently remunerative. But it was right also to remember that that very report was discussed by the meeting to which it was present, and which consisted of gentlemen well acquainted with the subject, including such names as Lord Lichfield, Lord Lyttelton, Mr. Alderman Waterlow, Mr. Akroyd, Mr. Hare, the representatives of the societies actually at work in building model dwellings, and others, and that meeting passed the following resolution over the head of the report of the Committee:—

> "That by proper attention to economy, by building only to the extent required by each district, and by the utmost care in avoiding unnecessary outlay and preliminary expenses, proper dwellings for the labouring classes CAN BE provided, which will *realise in towns a fair dividend on the capital expended.*"

Here, then, they had the authority of a meeting of practical men as against the authority of the report of a Committee, and specially discussing that report.

With respect to the dwellings of the different associations, it might be admitted, they perhaps did not pay more than 5 per cent. on the average. At the meeting of the Society of Arts, a gentleman now in the room, the Secretary of the Metropolitan Association, stated that "the family dwellings with which he was connected had always paid 5 per cent., and those more recently built paid 6 per cent." He thought it would be interesting if the members of this Institute would apply themselves to the consideration of some of the plans of buildings actually erected he had brought with him [referring to numerous drawings and plans on the table], with a view to ascertain the *causes* of their partial commercial failure. As an example of what light architects might throw upon this subject, he would respectfully invite attention to the details of one or two of them; amongst them was the plan of the Pancras Square buildings. Speaking as a layman on this subject, he wished to do so with diffidence; but looking at that block, it seemed to him that the most had not been made of the ground; that more space than was necessary was left for light and air, considering the locality was bounded by wide streets on three sides of it. In addition to this, a very large space was appropriated for a play ground; but having had the means of ascertaining the opinions of the people on that subject, he found that it was really an objection that this means of promiscuous mixing of the children was provided. He would refer them also to the walls dividing rooms of the same tenement from each other, which were, as he thought, of the unnecessary thickness of nine inches. He thought that was an unnecessary expense in the cost of the building, whilst the cost was enhanced by so much open space being kept, which might otherwise be turned to advantage. He threw out these hints with much submission; but it also struck him if this work had been undertaken by a purely commercial association instead of by one which had restricted itself to a dividend of 5 per cent. much more might have been made of it in the way of economising the expenses, and the ground floors might have been made into shops, which would have brought a better return than when occupied as mere private residences. If that had been done, instead of paying 5 per cent., they might have been made to yield 8 or 9 per cent. With regard to the very poor, as he said at the last meeting, they could not hope to make a profit from them, as they must always, to a certain extent, be objects of charity, either private or public.

Mr. HENRY A. DARBISHIRE, Fellow, rose to call attention to a statement made by Professor Kerr at the last meeting. That gentleman was reported to have said,—"It comes, then, to be a question whether the good cause before us is not suffering under the misfortune of an actual mis-direction of the funds contributed for its admirable purposes, by the almost unexampled generosity of various philanthropic persons. For when Mr. Peabody lays down his hundreds of thousands, and Miss Coutts and others display almost equal profusion in their liberality, they take no responsibility upon themselves as to the mode in which their money is to be laid out. They say, in effect, 'Here are the overflowings of God's bounty to ourselves; our purpose is to house the poor who need housing so much; and we look to you who profess to understand the subject, to see that these funds are dispensed for the real benefit of the class in whose behalf you so deeply excite our sympathy.' If, therefore, for reasons which amount to mere crochets, these funds are made to miss that mark, I venture to say, there is a very serious responsibility resting somewhere." Now, he knew Professor Kerr had no authority whatever for stating that neither Miss Coutts nor Mr. Peabody had watched most carefully over the distribution of every shilling of the large sums of money they had placed at his (Mr. Darbishire's) disposal, and as they were not personally acquainted with Professor Kerr, he could not know the very great trouble and great anxiety which they both had taken before a single brick was laid of the buildings which they had founded. Neither could Professor Kerr be aware that when one set of buildings was finished, the result of that building was carefully watched before another was begun. Neither Miss Coutts nor Mr. Peabody felt so little the responsibility which their wealth imposed upon them, as to allow other people to spend their money without knowing exactly how it was spent. Miss Coutts's buildings were erected after an experiment made by a Committee of the Officers of the Brigade of Guards in 1853–54, who built some dwellings for married soldiers just before the Crimean War. Being a personal friend of several of the Committee he (Mr. Darbishire) undertook to keep the work going during the absence of the Committee in the Crimea. These consisted for the most part of tenements of two and three rooms, the former letting at 2s. and the latter at 3s. per week. The building fund was raised by debentures, of which Miss Burdett Coutts took several, and as she was interested in its welfare, it occurred to her that much good might be done by providing similar accommodation for civilians who were too poor to pay more than the same rents; she therefore built the first block in Columbia Square with that view. When that building was finished it was visited by a great many persons, including the most experienced philanthropists of London and different parts of the country, and from the continent, and when their judgment was satisfactory to Miss Coutts, she proceeded with the other buildings which had since been erected. When the trustees of the Peabody Fund were appointed, they also visited these buildings and others of a similar kind in London, and after they had done so, they were convinced that the plans of Miss Coutts's buildings were the best for their own purposes, and for that reason those buildings were carried out. Therefore, he thought it hardly fair to assert that neither Miss Coutts nor Mr. Peabody were responsible for the distribution of the large funds which they had placed at his (Mr. Darbishire's) disposal.

Professor KERR observed that he had not said the funds were at Mr. Darbishire's disposal, and Mr. Darbishire apologised for the mistake.

THE PRESIDENT said he would now call upon Mr. Paterson, a Cabinet Maker, and Member of the Council of a Working Man's Club and Mechanics' Institution, who, he said, would speak on this subject from a practical point of view.

MR. PATERSON, Visitor, said he appeared with some diffidence before an assembly of professional men; still, in a humble way he had paid attention to this subject for many years, and had been much brought into contact with the class whose wants in respect of dwellings they were considering; he had also watched with great interest the movements that had been made to remedy the evils complained of. Reading over Professor Kerr's paper, he was struck with the force of some of his remarks, though he did not agree with all the inferences drawn. To suppose that a family living in a single room, even with grown up children, were necessarily degraded by such a condition, was, he thought, going much too far. But to say that people had preserved themselves in decency and decorum under such unfavourable circumstances, was scarcely an argument in favour of the perpetuation of such a condition, because they must bear in mind that on what they did now, the system for the next eighty or a hundred years would greatly depend. Taking the subject from a practical point of view, he knew what those accustomed to let rooms would do, if they had rooms of the size proposed—say 20 by 17 feet. They would at once divide them into two rooms, and the additional rent obtained would not only repay the expense of the division, but bring an increased profit afterwards. It might be said that the inmates could do this to suit their own convenience, but it must be remembered that a flimsy partition pervious to every sound, was often, as regards decency, worse than none at all. The next object in view, after ideas of decency, was comfort. Single rooms of the size stated, would be in a continual "muddle." It was very trying for a person with any notions of comfort and order to be constantly in an ill-arranged room, with a bed and all the disagreeableness of a bed-room before them all day. On the question of ventilation, it did not necessarily follow that a large room must be better ventilated than a small one. He had gone into large rooms occupied by families—a man and wife and three or four children, with half a dozen pigeons, some rabbits, and a 'single man lodger'; every opening in the way of ventilation closed up, and the closeness of the atmosphere unhealthy and opressive in the extreme. The ventilation did not depend upon the size of the room. They might have a room of 10,000 cubic feet, but if the external air was carefully excluded, the air in the room would soon become vitiated. The same room divided into two apartments would often be more easily warmed and more easily ventilated. If he were to state what the working classes wanted, he might no doubt mention many things which they probably would not get. They hardly understood their own wants, and the real difficulty had not been met, for they had not touched the class most difficult to deal with. There was a class who could not occupy the "model" houses, and who could not afford to pay more than 1*s.* 6*d.* per week rent. Some landlords had been benevolent enough to give them all the conveniences they could for that sum. Water closets well supplied with water were provided, but within a week all the fittings were stolen, and the closet itself was left in a most offensive state. He quite agreed that it was useless to provide conveniences for the working classes which they did not appreciate,—even in model dwellings they often became a nuisance. He believed they could lower the cost of the buildings in this respect, but not in the number of rooms they provided. The question amounted to this: provide such dwellings as would give the class who inhabit them the best opportunity of decency and order, and the best means of keeping the places warmed and ventilated at the same time; and add afterwards the conveniences of sink, water closet, &c., when they were educated to appreciate them. This was the direction in which he thought they must endeavour to go. When he spoke of the plans of these buildings he appreciated the benevolent motives displayed in so many quarters, and the labour that had been bestowed upon this subject by persons of high position; but still the result was far from satisfactory. Taking the plans of Mr. Alderman Waterlow's buildings, in the wings there was one square room well lighted, but in the centre of the block the rooms were badly shaped, deficient in light, and a large space was occupied by passages. He had tried to make some rough plans of his own. His idea was to have square rooms with as small an amount of passage as possible. The rooms should be of a size to admit of their being comfortably warmed, without a large consumption of fuel. He thought it was most important to consider whether some economical means of warming the air in these buildings could not be contrived, as a means of preventing the exclusion of fresh air by the inmates, who regarded a cold draught of air as the greatest nuisance that could be inflicted on them. By a due provision for introducing warm air, they might have small rooms which would be healthy and at the same time within the means of the occupants to pay for them. It would not become him to enter into a criticism of the various plans before them, but it had been said they could not provide for the poorest classes without making them, to some extent, objects of charity. He thought charity misapplied when the regular wants of life depended on it, especially such a matter as a dwelling. He should feel himself degraded every day by living in a house granted to him at a lower rent than it was known to be worth. He did not understand house-building companies being the missionaries of civilization among the poor. That was not their purpose; but if honestly carried out they might do much even with a profit. But as a working man,—even if he were among the lowest class of the poor,—he would say, let him have as good accommodation as they could give for the rent he paid; but do not give him more than he was able to pay for. Then he would feel he filled his place in society, and did not degrade himself by living in rooms, the rent of which he could not meet without assistance.

[Mr. Wm. White, Fellow, being unable to attend the meeting, the following remarks on the subject under discussion were forwarded by him, and read by Mr. C. F. Hayward, Hon. Sec.] The difficult problem of providing fitting homes for the poorer classes is one in which I have been much interested, and is one that has already engaged my attention. I had, indeed, prepared some notes upon this very subject a year or two ago, for an Institute in a manufacturing town in the north of England. I do not see that the mode of meeting it proposed by Professor Kerr is in any way a solution of the problem, for the simple reason that the construction of one-roomed cottages in the way proposed by him would cost quite, or very nearly, as much as an arrangement of two rooms: that is to say, with an equal amount of available space for habitable purposes. The extra partitions would be but trifling; even if the floors of the other cost no more. And all simplicity of treatment in detail, and in the omission of many of the little finishings and comforts required for higher classes of houses would be equally applicable whether the same space were divided into two or not, and indeed it would naturally suggest itself for the class of persons indicated. Every thing simple, plain and strong, such as to be as little susceptible of damage as possible would be of the first consideration. The great difficulty at present existing is the excessive want of a sufficient number of habitations of any sort for the poorest classes; and although it is notorious that, according to the old wretched system [when worked unscrupulously, as commonly it had been till of late years], the returns have been often extravagantly remunerative, yet these returns have been at the cost of a very harsh and troublesome supervision, which would be scarcely undertaken by any respectable class of speculators, or for ordinary investment. And it has been at the sacrifice of the poor, who have been obliged to put up with the best that they could get for their money. The philanthropic endeavour of Mr. Peabody, by which the investment is made to pay a really remunerative interest, may mitigate a portion of the evil, as regards the upper class of mechanics. Little or nothing, however, will be effected towards providing better homes for the poorest class so long as the buildings are suitable only to the higher class. Indeed, the true working of the Peabody fund cannot be better shewn than by the extraordinary restriction put upon the occupation of the houses—that their tenants' wages shall be, at the least, some twenty-three shillings per week, as I understand. Had the restriction been in the opposite direction,—that the occupants should be receiving no more than this same amount as a maximum,—there might have been a real benefit to the class for whom this bequest appears to me to have been made, and there would not be the same objection to the eleemosynary principle being involved to such an extent with people who at present, so far as one can judge, would be benefited rather than injured in their self-respect and independence of character by being raised into a somewhat higher position in the social scale through the very fact of this improvement in their homes. But then the Peabody trust must build houses on a much smaller scale, which as a matter of proper remuneration *could* be let for 1s 6d. or 2s. per week. Then some good may be done for them. But now it is actually proposed to extend the same state of things to other localities round the metropolis, that all parts may be equally benefited. The result is that persons who, I have reason to know, could afford to pay higher rent get possession of these houses because they are able to occupy them at less rent than their old less comfortable houses. I fear that the intention of this very noble and disinterested bequest will be almost worse than neutralised, excepting that to some extent it will make room for others of a lower stamp to take the class of house thus abandoned by the more fortunate but less needy portions of the community. Still this is a *secondary* benefit. Houses with smaller accommodation must be built, which can be let at a lower rent, such as shall not afford an inducement to the better sort of mechanic to move into, severely simple in their finish; and thus the humbler class may be reached. *These* might even be allowed to pay a lower interest, arising from the profits of the other. But as regards the higher class, it would be a mistake as a mere piece of economy not to make their return pay as high a rate of interest as *can* be made out of them. In the case of the lower class of habitation there could be no objection to their embracing to some extent an eleemosynary principle. But let the higher be as it were an investment of money, which shall pay a higher interest as well as benefit the higher class. The profits and residue might then go to the real amelioration of the lowest class; exactly after the manner worked out with wonderful success by Mr. Woodward in the scheme which he originated for middle-class education. Then and then only, as it seems to me, will the intention of the donor be properly carried out. I only wish that some representation could be made to the

Committee of the Peabody Trust shewing the tendency of their present course. As regards one most practical way of really reaching the lowest class in the improvement of their habitations, let it be made penal to expose for letting an unfit habitation as it is to expose meat in the market which is unfit for human food, which the poor will purchase regardless of health and even life. Then the proprietors of cottages will bestir themselves to carry out a better system, and the nature of such property being raised there will be the greater probability of increased investment being made, (even if at less remuneration) from the fact of the greater security by its greater respectability of arrangement. There is no fear of the market being overstocked for many years to come in respect of such houses. What may *constitute* fitness for habitation would of course remain to be shewn; but all houses ought to be condemned which have not due provision for pure water supply, proper drainage, thorough ventilation, sufficient light, decent tenantable repair, and enough spaciousness in approach and courtleges for the admission of external air. I may add from my personal knowledge, and from enquiries I have made of those who know them, and from one especially whose whole time almost has been spent for some years in investigating the condition of the most debased classes of mechanics and other labouring poor, I am convinced that it is not from desire, but from real or imaginary compulsion, if in any case, the poor prefer a single room to two, and that if they can be procured, two rooms are in very many respects better than one.

Mr. W. HOVENDEN HENDRY, Associate, in making a few remarks on the proposed plan, said that from experience he considered it impracticable, and far too costly. There was no necessity for gangways and the large yards (8 ft. wide) at the back. They were very costly, bad for light and ventilation, and would entirely prevent the sun, for nearly the whole of the day, from entering the apartments, thus making them little better than cellars above ground. He saw also that Professor Kerr proposed one of the divisions as a work-room for a tailor or seamstress: now it was evident, with this great projection above their windows, that they could not see to use their needles. Another objection was, that people passing along the front would always be looking in at the window, much to the discomfort of the tenant. The dust-shoot so placed, also would be an objection, for such receptacles were always foul, and oftentimes the dust returned into the room. There was a similar objection to ventilating the cupboards with air-bricks, as nothing could be kept clean in it. The want of a sink, too (enclosed or otherwise), with water laid on, would be greatly felt, especially for old persons or invalids, who could not well bear inclement weather; and if placed where shown, they would stand the chance of being frozen during half the winter. The arrangement, he thought, was morally bad, and almost uninhabitable, as it would be besieged in every part with draughts; and, lastly, the rent suggested would be exorbitant, as no working man that only earned £1. per week could pay 3s. or 3s. 6d. rent and keep a wife and probably a child. Besides, cheaper tenements could be built. We need only visit the doings of our neighbours. The plans that he had sketched on the board were based upon those in Quartier St. Martel, Batignolles, &c., which let for 2s., 2s. 6d., and 3s. respectively; and the vast accommodation, decency, and comfort, displayed in the arrangement, were far superior to any thing that had been hinted at here. Then, as to this class of building paying only 5 per cent., it was simply ridiculous from a commercial point of view: those that he proposed, built either in groups or streets, would pay 10 to 15 per cent. clear profit; but it would require, as it were, a science of building which we are not accustomed to in England. He could not conclude without thanking the learned Professor for his useful and interesting statistics, and the manner he had brought the subject before them, but ventured to remark that he was somewhat surprised that the Professor should advocate a plan which must necessarily be immoral, and leading, as the family grew up, to indecency and probably even to profligacy, and therefore not denoting that progress which one naturally would expect in this age of advancement.

MR. EDWARD HALL, F.S.A. (Visitor), said, he wished to be allowed to point to one lesson from

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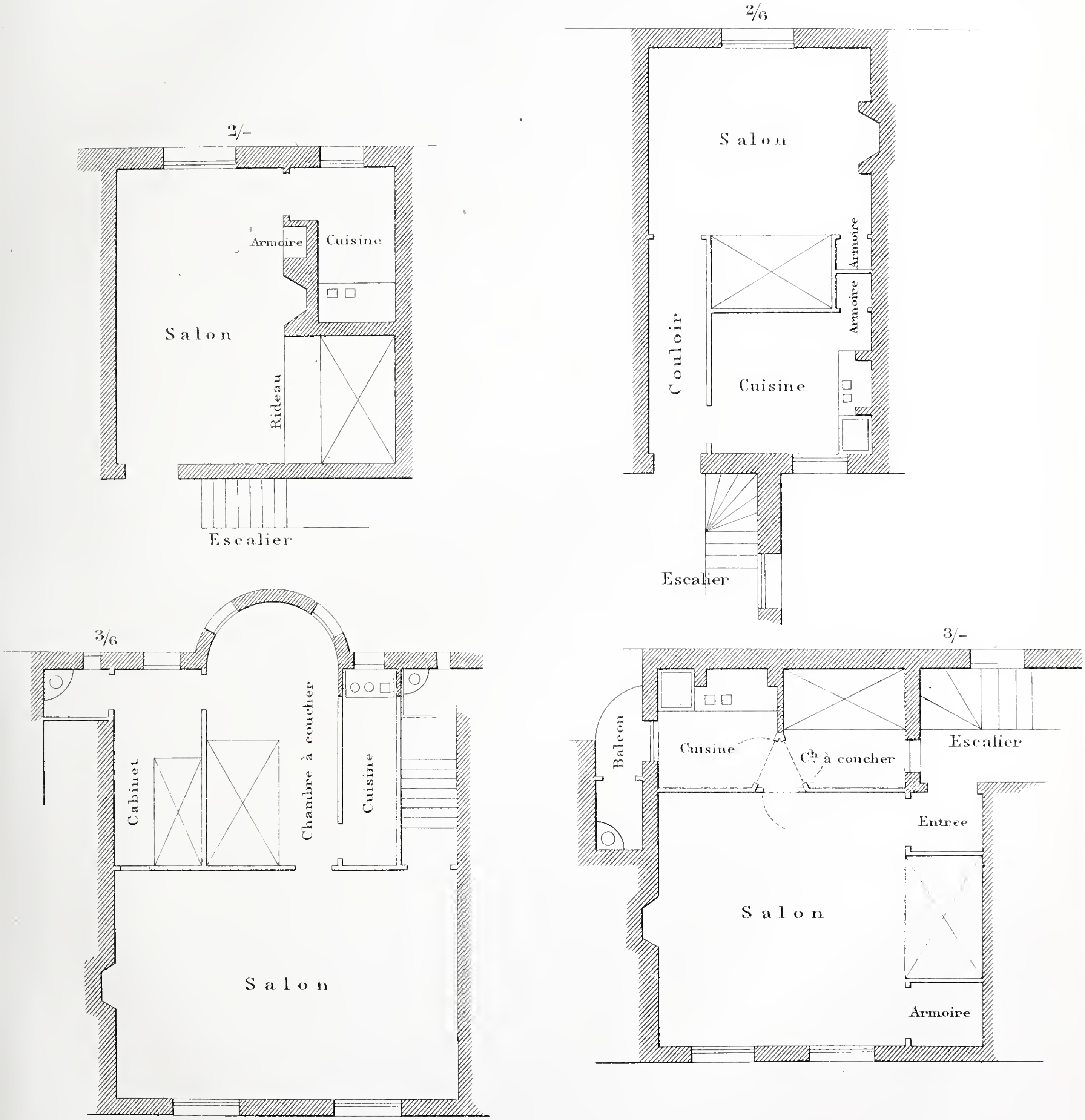
DWELLINGS FOR THE POOR IN TOWNS.



DWELLINGS FOR THE POOR IN PARIS.

1/8th Scale.

dresse par l'Architecte soussigne
W. Hovenden Hendry, London, 1867.

Lithogd. for the R.I.B.A by Kell Bros. London. E. C.

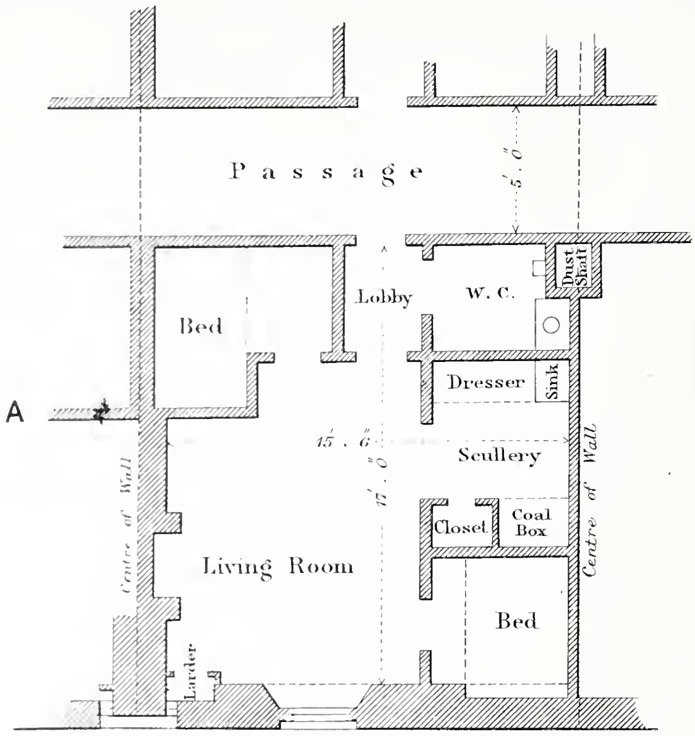
what had just been stated. The quarter of the Batignolles, where the houses that had been mentioned were situate, was now in direct communication with the most expensive quarter of Paris. This had been effected through the formation of the new direct route of the Boulevard Malesherbes, along which omnibuses now ran; and he would suggest that the question of planning,—or in this case town and street-planning,—had even more to do with the providing of dwellings than was generally considered. Mr. Henry Roberts had long since shown what might be effected by planning, as to houses themselves; but one great difficulty in connection with the subject, was admittedly that of obtaining suitable sites in London. If, however, they could improve the general planning of the streets, they would be able to provide sites at the outskirts of London, practically contiguous to, because in direct communication with, the quarters where employment was to be found, if not also sites in the town itself. He might mention, further, that, in London, as in Paris, the system was now obtaining to some extent of removing large manufactories from expensive localities, to the suburbs, where the *employés* could find places of residence. Messrs. Letts, of Cornhill, had erected an extensive manufactory at New Cross; in which neighbourhood, doubtless, their workmen were able to get dwellings at rents within their means. He felt more than ever that the matter of planning was at the root of the question, and not only planning as to the houses themselves of the metropolis, but also as to the streets and other lines of communication.

Rev. **RICHARD BURGESS**, B.D., Hon. Member, observed this was one of the most important subjects which had been discussed in this Institute for some time, because, as it had been well remarked by a preceding speaker, that what they decided upon now, might affect the condition, as far as lodging was concerned, of the present and two or three succeeding generations. He would give them a plain statement of what he had experienced both financially and in other respects, in connection with lodgings for the poor during a period of sixteen years. It was sixteen years ago since he found in his parish (Chelsea) a house, which had been some time vacant. Every pane of glass in the windows was broken; many barrow loads of stones, and a proportionate quantity of dirt were removed from the rooms. He bought the lease of that house, which had sixteen years to run. He mentioned this because he believed they would find that the building of immense edifices for the occupation of the poor, would not be so effective as taking houses already located, and turning them into habitable places for the poor. He bargained for the lease for £200., and determined to lay out £100. in making the house fit for the accommodation of lodgers. The £300. was soon raised in £10. shares by some of his parishioners. The great point was to get a return of 5 per cent. to the shareholders, and a return of the capital during the term of the lease. The house in question was large and exceedingly well built, having been erected in the time of George III., and partly at his expense, for the purposes of an old *virtuoso*, who had his collection of curiosities there, and was often visited by the King. He was sorry that the ruthless claims of railways had led to the house being taken down a few months ago, for the Metropolitan Extension Railway running under Sloane Square. His (Mr. Burgess's) plan of letting was as follows:—for the two rooms on the ground floor, with kitchen below, he charged 4*s.* per week; the two rooms above were let for 3*s.* 6*d.*; two single rooms, detached, let to widows for 1*s.* 3*d.* per week, each. This was the case in each house, and the total weekly rent was £1. 13*s.* 6*d.*, or £84. per annum. Out of that sum he had to pay £8. 8*s.* 6*d.* a year, ground rent; rates and taxes, which were exceedingly high in Chelsea, being about a quarter of the rent at which the houses were rated. The water supply (from cisterns) and gas (for we provided them with gas) amounted to about £7. 14*s.*, and current repairs to about the same sum, per annum; the agent and collector of rents being directed to make lodgers comfortable. Thus his annual outlay amounted to £40., leaving him with a profit of £44. a year, which sum was applied to the liquidating of the £300. capital, and the payment of £5. per cent. interest to the shareholders. Thus at the end of eight years he get back the whole of the £300., with £5. per cent. upon it, so that for the last eight years the £44. a year had been all profit, and he now had £150., minus £20. in the savings' bank, ready to be applied to another similar enterprise. He was now looking for another house to buy the lease of it. This was the point to which he thought their attention ought to be turned. In going from Charing Cross to London Bridge they passed a great number of houses—whole lines of houses, with little bits of yards at the back. If the leases of those could be bought, and money laid out on those houses, they would be able to provide a great number of homes for the poor without entering into those great building undertakings which the poor did not like to live in because they were altogether so different from anything they had been accustomed to. He would not like to have property of which it was difficult to say what would ultimately be its fate: but his experience taught him the best way of meeting the question in London was to buy up existing dwellings. The case he had brought before them was an exceptional one, he admitted, that under the circumstances he got the lease cheap; but they saw the result. He had made a large profit by it; and at the same time the rents were within the means of the occupants, and they were provided with good accommodation. He repeated that the poor, for whom they wished to provide dwellings, were, as a rule, averse to living in those immense modern or model edifices. They wanted something approaching to a house of their own. He hoped this idea would be taken up more extensively than it had been. Lord Shaftesbury and many others came to see his (Mr. Burgess's) model lodging house, and it was deemed of sufficient interest to get noticed in *The Times*, in which some doubt was expressed whether he had given a perfectly correct statement of the results; but he sent to the same journal the items of receipts and expenditure, which they did him the honour to publish. He could assure them the results were exactly as he stated them, and the money was in the bank ready for another enterprise of the same kind. There was one thing he was glad to see in Professor Kerr's paper, and ought always to be borne in mind; that was, that the object they had in view could never be accomplished by mere benevolence. It must be made a commercial matter, or it would never be done at all. It must pay itself commercially, or it would never be carried to any great length, for what had been done by benevolence had only touched the outskirts of the case. He was very much gratified with the remarks of Mr. Paterson, and agreed with him that it was a mistake to give the poor more in the shape of dwellings than they could pay for, or more accommodation than they really wanted. Let them have a good article for what they paid for; educate them not to shut out every breath of fresh air, whether their rooms were large or small. He could not express himself favourably to the single room system, because it was to a great extent antagonistic to those decencies of social life which they wished to promote amongst this class of the population. He had merely drawn a figure on a diminutive scale, but the geometrician knew that if the proportion and properties of the figure were true, they would be equally so if the lines were drawn on the expanse of the firmament to any length; what has been found true of a single lodging house, containing 22 families, may be found equally true of 22,000.

Mr. WYATT PAPWORTH, Fellow, considered that Mr. Burgess was to be congratulated on the results of his endeavours, for those who entered into such speculations did not always come out of them so well. He understood the reverend gentleman to state that the house in question had been taken by a railway company; and, if so, that circumstance had relieved him of what was the dread of every tenant at the expiration of a lease—namely, the claim of the landlord for dilapidations. If the lease had lapsed in the ordinary way, he thought the reverend gentleman would have found himself out of pocket, or his profits considerably reduced, by these dilapidations, which in a house of the sort described would, he apprehended, have been large.

Mr. BURGESS said he made the house better than it was. The railway company had treated him very liberally. He estimated the remainder of the lease to be worth £50., but they gave him £100.

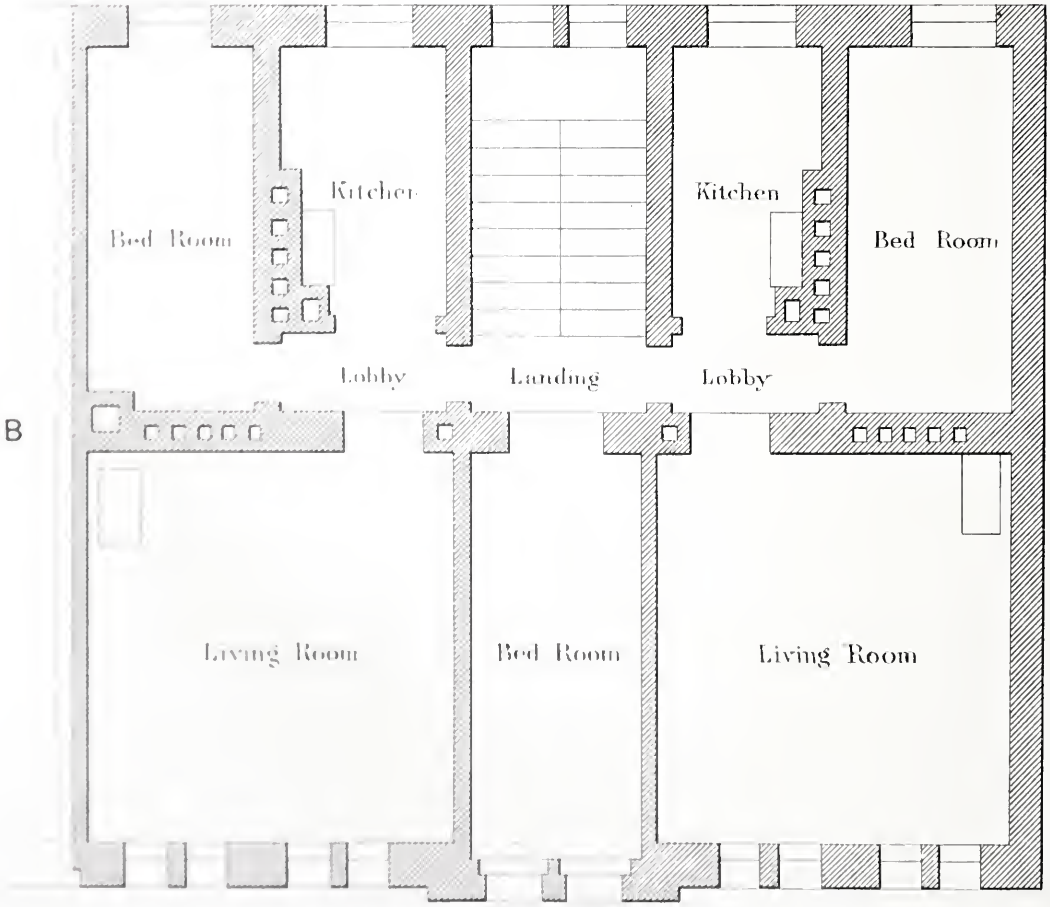
DWELLINGS FOR THE POOR IN TOWNS.



LUMSDEN DWELLINGS, GLASGOW.

J. Wylson, Archt. 1848.

Rooms 9 Feet high. Enclosures 7 Feet high.



ARTIZAN'S DWELLING, BERLIN.

A [illegible]
B [illegible]

1/8th Scale

Mr. PAPWORTH generally found that tenants considered they left a house in a better state than when they entered on the lease; not so, the landlords. He thought it was only under the favourable circumstances mentioned that so large a profit as that stated would be made of such property, as dilapidations usually involved an outlay on the expiration of the lease.

Mr. BURGESS added that during the whole period he did not lose £5. from non-payment of the rents, and there was scarcely ever a room empty. His greatest loss was by an Irish family, who got into his house without a recommendation, and he got rid of them by forgiving their arrears of rent, and that was a system he recommended to Irish landlords generally.

Mr. PAPWORTH continued: The meeting, he thought, had lost sight of the main question—whether a single room would or would not meet the requirements of the *poorest classes.* If a poor man appreciated the merits, and could afford to have two or three rooms for his accommodation, he would no doubt rent them; but, if he had a family, and had only sufficient money to pay for one room, he must limit himself to it, whatever might be the result. Looking over some statistics, with regard to the usual accommodation afforded, he had found but one case of single-roomed houses in London—Newton's Rents, at Stepney, which appeared to be very bad. He had a return relating to Scotland, showing that "nearly one million of the people of Scotland, or nearly one-third of the entire population, are living in one-roomed tenements. In Edinburgh there were 1530 of such houses, while in Glasgow there were 2212." The fact that one-third of the population of Scotland was living in one-roomed tenements was a very important point.

Professor KERR said, that would be no criterion for London.

Mr. PAPWORTH remarked that these houses were not to be copied. Some persons had been contriving to provide a better class of accommodation, and that in what were called the "Lumsden Dwellings," at Glasgow, designed in 1848, by Mr. James Wylson, there were in all thirty-one single rooms. The building consisted of four storeys in height, and being divided by a passage communicating with a common staircase; the rooms on each side of the passage were each 17 feet by 16 feet, a size rather smaller than Professor Kerr had suggested. Each room or main apartment included a lobby, water closet, &c., a scullery with conveniences, and two bed closets as far apart as possible, and of a size sufficiently large in which to dress and undress. These were all separated from the sitting room and from each other by screens 7 feet in height, the rooms being 9 and 10 feet. The rent of each house was £6. per annum, the whole block being occupied by a superior grade of working people, in whom there was sufficient confidence to collect the rents quarterly instead of weekly. (Fig. represents one of the main apartments with its arrangements). The only other point he would touch upon was, that many of those who had preceded him in this discussion appeared to consider that only *families* had to be provided for; but he thought they had not sufficiently taken into the question the existence of the many widows, such as the Rev. Mr. Burgess had noticed, spinsters, childless couples, and others, who would find sufficient accommodation in a one-roomed tenement. He should be in favour of a much larger number of single rooms being provided, if even a little less in size than that suggested by Professor Kerr; and he thought a building about four storeys in height, containing single rooms of the smaller size, would be found to meet all the requirements of the poorest classes, and to pay a large per centage upon a carefully considered outlay in its erection and management.

Mr. CHARLES FOWLER, Jun., Fellow, hoped to have heard more information with regard to what had been done in this matter in some of the Continental cities. He laid before the meeting a few plans of artizans' dwellings in Germany, and he was glad Mr. Hendry had brought before them some details of the French system. One of the plans before them was the type of a considerable number of buildings erected in Berlin, since the years 1849-50. The rooms were of good size, and consisted of suites of two rooms, a small kitchen, and water closet. There were two dwellings on each floor, with a stone staircase, and the buildings were carried to a height of five storeys; the dwellings were let at rents which produced a return of $5\frac{3}{4}$ per cent. Mr. Fowler added that in the neighbourhood of Prague, one hundred cottages were built for the miners there; but he had no statistics respecting the cost or rents. The houses consisted of two rooms, with a loft above and a cellar below.

Professor KERR, Fellow, said he had already sent up a message to the chair desiring to be allowed to waive his right of reply, for the sake of allowing all the time to other speakers; and he would undertake to transmit to the Secretaries some concluding notes for the Transactions whereby to complete the discussion—*(Vide Sequel)*.

The PRESIDENT said the Institute owed a great debt of gratitude to Professor Kerr for having raised before them a question of this sort, so important in every point of view, moral, social, and architectural. They saw that moralists and philanthropists had got hold of it, and they (the architects) were the people who must provide the material on which they had to work: if, therefore, they had remained silent, they would have been wanting to the occasion. He was glad the architects had had their say, and he considered the three evenings which had been devoted to the subject were well spent. He was sure they must all have been much gratified by the speech they had heard this evening, coming from a practical man, who, though probably not accustomed to speaking before an assembly like this, had delivered his sound good sense ideas in very excellent English. He thought that address must have made a strong impression upon them all. It placed the main points very clearly before them, and showed them, which was important to be recollected, that they must not deal with this question in an eleemosynary spirit, and must avoid "patronising" the people for whom they built these dwellings. They were people of common sense, and could see through patronage as easily as any one. Of course every one wish that kindly feelings should always exist between landlord and tenant all the world over: that they should not look upon each other as enemies, but as friends co-operating together for each other's advantage. A good state of things was created which was far removed from the idea of patronage. That was the condition of things which Mr. Paterson evidently wished to exist, as he would feel uncomfortable, and not in his proper position, if he did not occupy a house which his own industry enabled him to hold. He had now the pleasure of proposing a vote of thanks to the author of the paper, and also to those gentlemen who during the subsequent evenings had so ably taken part in the discussion which it had elicited.

The vote of thanks being then passed by acclamation, the meeting adjourned.

CONCLUDING NOTES COMMUNICATED BY PROFESSOR KERR.

Perhaps I shall be best serving the interests of this discussion by now putting my reply into a certain peculiar and very limited form. I dare say no one particularly cares to know merely what I may have to say in further defence of one proposition or another advanced by me and assailed by others; but if I state generally the impression which has been left upon my mind by the debate as a whole, this may serve to fix the attention of readers of the Transactions upon the real issue submitted for their consideration.

Allow me by way of preface to explain my own interest in the case. I represent nothing more exalted, but nothing less severe, than scientific curiosity. Whatever philanthropy or sentimental feeling I may chance to possess does not happen to lead me specially towards the subject of the dwellings for the poor. I have had no sort of connection with the social movement in relation thereto; it was merely incidentally that I stumbled upon what I considered to be an interesting question of *domestic plan* (none the less interesting because so humble); I am known to be a student of domestic plan; and it is in this capacity alone that I have ventured to set on foot a discussion intended to be professional and no more.

The vast extent of the general enquiry which is more or less suggested by the idea of an exhaustive treatment of the subject of improving the dwellings of the labouring classes has been well illustrated in the course of our controversy. To mention only those more prominent points which at once occur to the mind; there is, for example, the sanitary question; one of the widest in its scope, and the most complex in its bearings: again, the question of overcrowding by subletting; most difficult indeed to deal with in any practical way: again, how to lodge the labourer sufficiently near to his labour; or, otherwise, how to overcome the obstacle of distance; to favour the piling up of family over family in the confined alleys of the town, or to carry the thousands of the artizans by some sort of magic to and from remote suburban villages: again, the questions of the action of charitable associations, whether sound or unsound; the co-operation of pure benevolence and commercial profit, whether possible or not; the duty of the employer to provide a home for the employed; the causes and effects of the farming of the inferior class of lodgings by leasehold tenants; and the possible benefit of co-operative action amongst the occupiers themselves: again, whether or not to promote legislative interference with ownership; and whether or not to seek state subsidies—to tax the country at large for the payment of London ground rents: again, how to deal with the eviction of the poor by public improvements—whether to tax, not the country, but these: again, how to design the dwellings themselves, to suit respectively the three classes of the working people,—here the comfortable and intelligent mechanic, there the humbler and ruder labourer, yonder the penniless, the debased, and the undeserving: lastly, how to remedy existing shortcomings, if not by the erection of new dwellings, by the amendment of the old: all great public questions, and every one of them the subject already of volumes of investigation and years upon years of debate, and likely to continue so through still other volumes and for still further years.

But amongst this array of questions, it is only one, and perhaps the smallest and least recondite of all, that we have had properly before us; namely the *plan* of the poor man's dwelling. Leaving to more profound philosophies all other subjects, we architects have been taxing our ingenuity a little with a view to pronouncing something like an opinion, the opinion of experts, upon at least this one point of simple common sense and expediency. And what has come of it? Not much, some may answer. I reply, perhaps more than at first appears. And if it be not very much at the most, yet in such a controversy we may be content with little.

At all events we have succeeded in bringing fairly out into public view no less than four competing principles of standard plan; namely, 1st—that of the "three bed rooms;" 2ndly—that of the "three rooms;" 3rdly—that of two rooms; and 4thly—that of one room, or rather a more or less comprehensive tenement in the primary form of one room. If we have effected no more, I think it will be found to be a good deal to have effected this; for public opinion is thus provided with a simple issue on a matter which has hitherto been very much involved in confusion, if not in mystery.

The basis upon which I at first laid the question before you was this—that the respectable working people were of two orders in respect of means; namely, the skilled workmen, generally possessing lodgings of two rooms, and the unskilled labourers, living in single rooms. I am now disposed to modify this basis, and to take the two orders together; because of the circumstance that, as respects the occupation of single rooms, I am led to believe that even the skilled mechanics accept at present that kind of lodging much more generally than I had supposed. I propose therefore to take up the above-mentioned four principles of plan, and to set forth the impression which our discussion has left upon my mind with regard to the applicability of each in its turn, not merely to the lower section, but to the whole body, of the ordinary working class.

First, then, we have the principle of the *three bed rooms.* When I used the expression " dogma " in originally introducing to you this idea, I did so advisedly; I meant to signify that it held the position of an accepted doctrine, a credo, not to be any more debated, but to be acted up to as best might be. And certainly it seems to me that our debate has so conclusively dissipated this attractive but mistaken notion, that, amongst its former adherents, one appears to vie with another in earnestly denying that the credo ever existed; in spite of the model plan published now nearly twenty years ago in the name of our illustrious and lamented Prince Consort; in spite of declaration after declaration ever since, alike from the platform and from the press; in spite of the recent language of a distinguished person, of all men most eminently entitled to be the mouthpiece of English philanthropy. But at all events, the principle may now be said to be entirely surrendered; and this is well. It had its origin in a very simple error, resulting from excess of good intention,—the mere over-estimate of the numerical value of the average family. The underlying notion was that a " liberal " standard must comprise parents, male children, and female children, with some of the children growing up. But a moment's reflection shows that this standard is not a fair one; liberal certainly as regards motive, but not reasonable as regards fact. In a word, although no doubt there are a certain number of cases in which a large family requires large accommodation, yet the most ordinary observer must perceive that such instances are the exception, and that to proceed upon the supposition that they are the rule is a mistake in policy of the most fatal kind.

The second of the five principles of plan now before us seems to be, properly speaking, the amended form of the foregoing. *Three rooms* are now pronounced to be the proper standard. The three rooms are primarily to constitute a living room and two bed rooms; the third bed room, when required, being, I suppose, to be had by so using the living room. Now, of course, we must all admit the fact that in a certain proportion of cases these three rooms ought specifically to be had; but such an admission is not all. The question remains, what is this proportion? I believe it will be found to be a very much smaller proportion than most persons would at first suppose. And I come to this conviction by that sober statistical calculation, without which no argument of this kind can be reliable. In my original statement I made it appear that only 8 per cent. of the whole class of poor families do urgently require three rooms for decency's sake. I am now persuaded that I may include with the inferior orders of labourers the whole general body of ordinary mechanics, at least in London, and say (it being the case that scarcely one of them will be found willing to pay rent for three rooms, except upon compulsion of decency, arising out of the number in family) that, as matter of fact, only about 8 or 10 per cent. of the entire class are actually under such compulsion. If this be so, then the conclusion is that in whatever scheme is proposed for improving the dwellings of the working classes, it is only about one tenement in a dozen that need (for the present) possess so many as three rooms; and I submit that this fact, far from being a subject for reproach, is to be welcomed as a material simplification of the problem.

Allow me here to set forth a certain further calculation which I have made upon a statistical basis, and which I was permitted to lay before the public a couple of weeks ago in the *Builder* journal.

The census of the United Kingdom gives us, as respects the ages of the population, the following facts:—Under ten years of age, 27 per cent.; between ten and twenty years, 21 per cent.; between twenty and fifty years, 37 per cent.; over fifty years, 15 per cent.

Let me designate these four divisions respectively by the terms,—1st, *Childhood;* 2nd, *Youth* (unmarried); 3rd, *Prime of Life* (possessing children, chiefly in childhood, some in youth); and, 4th, *Age* (possessing children, chiefly in youth). I propose to sub-classify these divisions, and to appropriate in detail the two divisions of childhood and youth to the parentage of the other two divisions, whereby to arrive at a classification of *homes*, as regards requisite scale of (minimum) accommodation. I have to premise that some of the youth under twenty will obviously have left the parental homes (as single-men lodgers, &c., and women servants); that some of those above twenty will be in the same case; that lodging-houses ought not to be included in the reckoning; that single men have not to be considered at all, but that single women have; in short, that it is the home-keepers alone that we have to deal with. Let me, then, at once set forth the following table :—

		Ages.				Homes.		
		Age.	Prime.	Youth.	Childhood.	One Room.	Two Rooms.	Three Rooms.
Childhood (27 per cent.)		—	—	—	27	—	—	—
Youth (21 per cent.)	Left home	—	—	4	—	—	—	—
	With parents widowed	—	—	4	—	—	—	—
	With parents married	—	—	13	—	—	—	—
Prime of Life (37 per cent.)	Married couples and families	—	17	8	13	4	3	1½
	Ditto without children	—	5	—	—	2½	—	—
	Widowed and families	—	5	2	4	3	2	—
	Single women alone	—	2	—	—	2	—	—
	Ditto in pairs	—	3	—	—	1½	—	—
	Left home	—	5	—	—	—	—	—
Age (15 per cent.)	Married couples and families	3	—	5	5	½	½	½
	Ditto without children	5	—	—	—	2½	—	—
	Widowed and families	3	—	2	5	2	1	—
	Single women alone	2	—	—	—	2	—	—
	Ditto in pairs	2	—	—	—	1	—	—
	Totals	15	37	17	27	21	6½	2
Equal to, per cent.						71	22	7

As a little explanation of this table may be necessary, let me point out that the 37 per cent. of people from 20 to 50 years of age I divide into 17 in married couples with families, and 5 the same without families, 5 widowed with families, 2 single women alone and 3 in pairs, and 5 as having left home as servants and lodgers (and thus gone out of the account); that the 15 per cent. over 50 years of age I divide into 3, 5, 3, 2, and 2, in like manner; that the 27 per cent. of children under 10 I appropriate as 13 and 4 to parents in the prime of life, and 5 and 5 to those in age; and that of the 21 per cent. of youth between 10 and 20 I consider 4 to have left home (and thus gone out of the account), 8 and 2 to belong to the younger class of parents, and 5 and 2 to the older class. I then assign to each subdivision of home-keepers such proportions of one, two, and three room lodgings as seem reasonable; for example, taking the principal class, that of married couples in the prime of life, with families, there being 17 persons (8½ couples) with 13 children young and 8 growing up, I assign to 4 of these couples one room, to 3 two rooms, and to 1½ three rooms; and so on with the other classes. The figures finally resulting as totals of homes in the form of 21, $6\frac{1}{2}$, and 2, are, of course, equivalent respectively to 71, 22, and 7 per cent.; so that, large as the 58 per cent. appeared for single rooms, when resulting from the St. George's statistics, I fear it must be said that we should have some difficulty in keeping to so low a figure in this fresh calculation.

This is, of course, entirely corroborative of my former estimate, as regards the three rooms.

The third of the proposed standards of plan is still more moderate in its demands. A correspondent of the *Builder*, himself a working man, formulates it very intelligibly as "*two rooms communicating*;" and I think I perceive a general leaning towards this notion as a minimum on the part of that large class of persons who now recognise the importance of the utmost moderation but are unable to see in a still simpler principle a thing capable of being made commodious and respectable. And certainly it cannot be denied that in seeking for a standard of accommodation, as we are doing, they who propose so reasonable a limit at least deserve success. But statistics must still be the test; for it is vain to shut our eyes even yet to the necessity of economising rent. This modest accommodation will be declined in its turn by those who can satisfy decency with less. And how many, then, are these? It seems very hard to say that perhaps not fewer than two-thirds of the entire order of common working people will be found to prefer, of course on the score of rental, single rooms; but so I cannot help estimating the fact. The argument has a certain speciousness in it that they ought to be educated up to the appreciation of more comfortable (and costly) accommodation; but, looking as they must be permitted to do, at the large per centage of their poor earnings which even at present goes for rent, I fear they are not likely to listen to any such doctrine. In a word, let us deal with the world of to-day, and leave to-morrow till it comes; let us take our poor brethren at their own poor standard, and make the best of it, looking less reproachfully at the present than hopefully towards the future. And therefore, if it be, as seems to be the fact, their established practice to content themselves with single room lodgings whenever the number in family can be decently accommodated therein, and if it be, as it apparently is, the definite result of statistical calculation that two-thirds of the whole come under this rule, it follows that even the two rooms now advocated will, in all probability, be more or less objected to, as an extravagance of its kind, by such two-thirds.

Another thing which has to be observed with reference to the two-room standard is, that it is at present in effect the universal plan of common house building; so that, if working people were really willing to pay for two-room lodgings, they could have them by the thousand in all quarters of London and elsewhere. The "floor of two rooms" in this very form (not generally communicating, but sufficiently nearly so) is in fact already the standard for the superior order of mechanics and other such persons; and the principle now before us is really nothing but a proposition to the effect that the poorer classes ought to be obliged to pay the same rent as those.

Here I may take occasion to notice a very common error which prevails, to the effect that the houses occupied by working people in London have been planned originally, not for such occupation, but for the very different requirements of single family residences, and that it is only because they have come down in the world that they are now tenanted as they are. This is in fact a very superficial notion, as every one who happens to be acquainted with the inferior practice of speculative building will testify. The plan of two rooms on the floor, with the stair in one back angle, is adopted quite irrespective of anything like family occupancy, because of its simplicity of division and of construction; and, in like manner, the superior character conferred generally, but not always, upon the ground and first floors does not necessarily result from any intention that these should be dining and drawing rooms, and the upper stories bed rooms, but, in scores upon scores of petty streets and terraces which are built in the suburbs, refers to the much simpler circumstance that these lower rooms are to be superior tenements, producing higher rents than those above. I therefore think it is important to understand that, so far as two-room lodgings are concerned, the common arrangements of London houses is in a manner quite sufficient: so that, if these pairs of rooms could be brought within the reach of the labouring classes generally, as regards rent, there is not much to be done, so far as mere plan goes, to improve them.

We come now to the fourth principle,—that of *single room accommodation.* When I ventured to suggest this idea at first, I scarcely understood it to possess so much novelty as it appears to do; and therefore I am naturally unwilling to commit myself too much to the support of what is at the utmost a mere experiment. But I am bound in candour to acknowledge that the more it has been discussed, and the more it has been controverted, the more clearly does it appear to me that something of this kind is very much wanted. If it be true that two-thirds, or even one-half, of the working classes, viewed as regards numbers in family, find sufficient accommodation in single rooms, then it cannot but be reasonable to say that, in any scheme of improved dwellings which, in its so-called liberality, ignores such a fact, there is a disregard of economical considerations which must of necessity prove a disadvantage in the rental market, so far at least as the two-thirds, or one-half, are concerned. In other words those families which already have more rooms than one may become tenants of the new dwellings which are planned on their own standard; but those which hitherto have occupied single rooms will decline the doubled accommodation at the doubled rent. Whereas, if we could devise some plan which, adhering to the received principle of the single room, and seeking apparently no higher standard, would provide in reality all the spaciousness and comprehensiveness of the higher standard, this would be a victory indeed. Even if the present single-room system were but a prejudice, it would be good policy to respect it; and as it is clearly a great deal more, so much the greater its claims upon the consideration of common-sense. To put the case in the form of a single practical proposition, I am constrained to say that I believe it would be the best possible course to adopt for the improvement of the dwellings of the common working classes, to build new tenements throughout the suburbs of London, and alter old ones more centrally situated, on some single-room principle, literally by the thousand: and I will go so far as to say further that, instead of building for the superior orders of these people as a means of making more room for the inferior orders, we should, in building for the inferior, much more effectually make room for the superior,—and this indeed by a direct effect upon existing tenements, which, considered as pairs of rooms, would become lowered in rental by reason of the competition of such single-room tenements as I hope would be brought into the market.

As regards the plan itself which I have ventured to put forward, I have no objection to any amount of improvement being made upon it, if I can only preserve the leading ideas upon which it is based; namely, perfect family privacy; spaciousness instead of partitionment; extreme simplicity, for cost* and rent, for construction, for usage and repair, for lighting and ventilating, for housekeeping, for furnishing, and for cleansing, To confound this principle with that of introducing a number of little separate rooms in some great group of tenements such as those which have been erected of late years, is idle: what I have proposed is quite another thing in all its applications. I confess I set great store by the special entrance door; and the special back-yard-balcony; and the party wall between family and family: I think, if all this could in any way be had, with that liberality of space the want of which is so great a discomfort, and without increase of cost, the poor man's wife, even with a family above the average in number, would contrive to help herself as regards mere partitionment much more than many may suppose possible; and if we can still further add, as I particularly desire to do in my scheme, the actual and obvious means of partitionment, as a definite part of the project, I cannot see that much more is wanted to meet the case of the vast majority of those who are in question. Let us provide three rooms occasionally for those who want them, two rooms for those who cannot do without them, but, above all, some sort of spacious, comprehensive, divisible, single room tenement, as the ordinary standard.

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* I ought to note that I adhere to the estimates stated in my lecture. The argument that my plan is equal in surface area to that of an ordinary model suite of three rooms, and therefore must cost as much, is easily tested by any surveyor: he will find that the *partitionment* tells up in cost more rapidly than the *space*.

The result of the whole discussion therefore appears to me to be this. The error of all high standards of accommodation has been proved and admitted; but the expediency of keeping to the very lowest standard is not yet so thoroughly acknowledged as I think it must some day be.

ON THE CONDITION OF ARCHITECTURE AND OF ARCHITECTURAL EDUCATION IN THE UNITED STATES.

By Wm. R. Ware, Esq., of Boston, U.S., Member of the American Institute of Architects.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, 28th January, 1867.

Mr. Ware, Visitor, (who, on rising, was received with great applause), addressed the meeting to the following effect:

The invitation I received at the meeting a fortnight ago, to tell you something of the condition of Architecture and of Architectural Education in the United States, came with the force of a command. The wishes of our benefactors are imperative, and I have enjoyed too many favours at the hands of this Institute and its individual members not to be glad to do anything that would even seem to repay them. It is some months since, at the instance of my kind friend Professor Donaldson, your Honorary Secretary for Foreign Correspondence favoured me with a circular letter of introduction, which has obtained for me in every part of England and in Scotland courtesies and kindnesses from the Fellows and Associates of this Society for which I cannot sufficiently express my obligations, and which I am glad to be able thus publicly to acknowledge.

But I am particularly willing to make the use you have indicated of the time put at my disposition, because I may perhaps thus best serve the two Institutions whose minister I am, the American Institute of Architects—a Society constituted in most respects like your own, and whose seat is in New York—and the Massachusetts Institute of Technology, established within a few years in Boston, the educational institution with which I am myself especially connected. In saying what I wish to say of their history and prospects, I shall perhaps best cover the ground you have staked out for me. The condition of the profession on the other side of the water may perhaps be most distinctly set forth in relating what the Institute is trying to do for its improvement, and our modes of building, in explaining the structures shewn in the photographs, with which you have done us the honour to cover your walls. The condition of architectural education may best be shewn in speaking of the only institution of learning which, so far as I know, has taken up this work in earnest.

Up to a very recent period—indeed I may say up to this time, the condition of architecture in the United States was very similar to that which it held in England twenty or thirty years ago, previous to the establishment of this Institute, or of the architectural periodicals which have done so much for its improvement. Building, in general, was to a small extent only in the hands of professional architects, and was, for the most part, carried on by builders and contractors. The professional architects of most of the large cities of the United States might be counted on the fingers of one hand, and their works were almost entirely confined to the more important public buildings, such as state houses, churches, custom-houses, and banks, the great bulk of the general work being done by masons, carpenters, and contractors, of one sort and another, in which the interests of art were left to take care of themselves. In the last century this state of things perhaps did not do so much harm. At that time the respectable practice obtained of following the rules of Vignola, and the consequence was, though there were no architects engaged in the work, the carpenters and mechanics following those rules covered the country with houses, not very novel indeed, but comely and decent. Amongst the photographs on the wall will be found illustrations of the works that were done under that regime,—cubical buildings with classical cornices and details, a repetition in wood of the sort of buildings erected in England during the last century, monuments of what the song calls the "good old colony times when we lived under the king;" these were the dwellings of the squires and local aristocracy, and the smaller houses were, in their degree, like unto them. The neighbourhoods around Boston are full of them, dating from before the American Revolution, and some have attached to them a good deal of historical and local interest. One of the best of these old houses, of more than ordinary pretensions, is standing on the outskirts of Cambridge, being the house which was occupied by General Washington during the siege of Boston, and now acquiring a new title to fame as the residence of the poet Longfellow.

This state of things has long been overthrown, and a succession of styles has since prevailed, faint adumbrations of the phenomena which European architecture has meantime exhibited. The influence of Stuart and Revett, and of Pugin, of the Italian school, of the German school, and of the French school, of the rage for cottages, and of the rage for castles, may easily be traced, together with any number of styles which native enterprise has concocted out of these various elements, making the confusion worse by confounding everything. This enterprise would have lacked its most obvious and characteristic manifestation, and the chaos would have remained incomplete, if its agents had not everywhere assumed the title and degree of architect. Under this dispensation the rules of professional procedure became corrupted and lost, artistic work pretty much unknown, and even the traditions of professional etiquette and the old-fashioned way of doing business, so far as we had ever inherited them from the mother country, fell into abeyance and were forgotten. Such changes were of course natural to a society which, from being part of an old nation, had come to a part of a new one, they were the phenomena of a state of transition, of which other things as well as the arts of building felt the influence.

But a state of transition is an uncomfortable one, as those architects found, who, in spite of everything, endeavoured to conform in their own practice to an ideal standard. It is hard for isolated individuals to stand against the current, and vain for them to try to turn it. Feeling that it was only by acting together that they could do anything to affect public opinion, that it was only by helping each other that they could themselves advance, a few architects in New York, eminent alike for professional attainments and for professional zeal, combined to establish a society, professedly modelled upon your own, its objects being, as its constitution declares, " to promote the artistic, scientific and practical perfection of its members; to facilitate their intercourse and good fellowship; to elevate the standing of the profession, and to combine the efforts of those engaged in the practice of architecture for the general advancement of the art."

In these objects it has succeeded, as I explained a fortnight ago, to the extent of promoting good will and confidence among its members, and establishing among them a considerable uniformity of professional procedure. It has also, by admitting them to its privileges as Associates, been of great service to young men, mostly the pupils of the older members, who have thus enjoyed the society and counsel of the most distinguished men of the profession. It has also, as I have said, by extending its fellowship to architects of other cities, been the means of producing an intercourse which has been of the greatest advantage to those who have shared it. They have not as yet attempted to enlist within their ranks the members of the profession at large, wisely preferring to try their experiment on a small scale at first, but they are now enlarging their operations, and rapidly extending their numbers and usefulness. I had the pleasure of handing to one of your Honorary Secretaries at the last meeting one of the printed papers of our Institute, in which it has been attempted to establish amongst the members of the Institute, and thus in the profession at large, fixed rules of procedure in their business, similar in its general character to that which has been issued by this Institute. Within the last few months it has been proposed to establish, under the direction of the Institute, an Architectural Journal, which shall at the same time benefit the profession and interest the public in architectural matters. From the circular issued by a committee of the Institute I will read a single paragraph, which fully explains its objects and character.

"It is proposed that the journal shall contain illustrations; so much of the Minutes of the Institute as would be of interest to the public; papers on the principles of design and general art criticism; discussions of problems of construction; correspondence from members, at home or abroad, both professional and honorary; notes of travel by architectural tourists; extracts and translations from foreign architectural and scientific periodicals; test cases of architectural litigation; prices current of building materials at the principal business centres; and other items of interest to the architect, or instructive to the public."

Nothing decisive has as yet been done upon this scheme, and this circular was only issued to the members of the Institute in order to elicit their counsel and advice. Still it shows, as far as it goes, the direction in which the institution is moving, and the field of usefulness which it proposes to occupy.

It may be interesting to you to hear something of the men by whom this Institute was originated, and of their works, to make, as it were, the personal acquaintance of your friends over the water. To this end I will give a brief account of the architects of the American Institute, beginning with those who have been bred as well as born in the United States. They were not in all cases the persons who have the largest professional practice; the largest share of work still falls into the hands of men who look upon architecture not as a profession, but only as a business, and who naturally possess the confidence and sympathy of a business community. Yet we are not without men of great and deserved repute; and of these the most eminent, and one whose eminence is illustrated by the photographs before you, is Mr. Thomas U. Walter, one of the Vice-Presidents of our society, the architect of the famous Girard College in Philadelphia, and of the extension of the Capitol at Washington.

The English architects belonging to our society are Mr. Withers, a name familiar in this place, and Mr. Diaper, still one of your members. Mr. Vaux, well known in this country by his publications, was formerly associated with Mr. Downing in the introduction into the United States of the English system of landscape gardening; and of late years, since the sudden and lamented death of Mr. Downing, he has largely devoted his attention to this branch of art, not, however, abandoning the practice of his profession, as these photographs attest. The bridges and other architectural embellishments of the Central Park, in the city of New York, have been erected chiefly from his designs.

Another Englishman, Mr. J. W. Mould—once, I believe, a pupil of Mr. Owen Jones, and a coadjutor with Mr. Vaux in the Central Park—was one of our earliest members, an architect whose works, though not numerous, show great vigour and fertility of mind, besides exhibiting the characteristics, rare on our side of the water, of the school in which he was trained. These circumstances have given him an influence, and an influence for good, as marked and extensive, perhaps, as that of any one of our number. The best qualities of his work are but inadequately exhibited in the photographs contributed to this collection.

The influence, however, of Mr. Upjohn, our beloved and venerable President, has been for thirty years far greater and more salutary than that of any other man in his own line of work. He was the first person in the United States to practice with thoroughness and fidelity the classical Gothic, if such a combination of terms is allowable in this audience. Well versed in the different English precedents, he set himself to build well-advised and defensible examples of the different styles in which he worked, and his first work of magnitude, Trinity Church in New York—standing at the lower part of Broadway, at the head of Wall Street—was and still is the most conspicuous and most extensive Gothic structure, perhaps, in the United States. The erection of this church, between 1840, I think, and 1845, was an era in the architectural history of the country.

Mr. Ware, after speaking in more detail of these and other architects and their works, especially of Mr. Eidlitz and Mr. Lienau, who represented the German and French influence, of Mr. Wight, the architect of the new Academy of Designs, and of Mr. Richard Hunt, the most eminent of the Americans educated abroad, and describing severally the illustrations of their work furnished by the photographs, which, as members of the American Institute, they had presented to this society through his hands, explained that the incompleteness of the collection was due to the haste in which it had been gathered together, these gentlemen having emptied their portfolios and stripped their walls rather than let him come without this mark of their respect and goodwill. He then proceeded to speak of the peculiarities of construction these buildings exhibited, especially in the methods of building in iron and in wood. The new dome of the Capitol, 100 feet in diameter, and 285 feet high, was the most important example of the first, built entirely of cast iron, inside and out, for the upper 216 feet, and braced and framed with iron trusses, as was shown in the photograph of the section taken from Mr. Walter's drawing. This structure was of course quite unique, but cast iron had been used a good deal for façades, instead of stone walls, both alone and in conjunction with brick. In design these iron fronts vary from the perfectly simple forms adapted to warehouses and workshops, to elaborate imitations of Venetian Renaissance palaces, sometimes backed up with brick, sometimes lined with only a lath and plaster partition.

The extent to which wooden buildings prevail, he continued, and their excellent quality, seems not to be understood in England. In the towns the buildings are of brick, the fronts often faced with stone. But in the country almost everywhere wood is the universal material, and the houses and churches built of it are perfectly firm, tight and warm. They only differ from stone or brick houses in the outer walls, the partitions within being, of course, of the ordinary construction, vertical studding, faced on each side with laths and plaster. The outside walls are built in the same way, lathed and plastered on the inside, but covered on the outside with two sets of horizontal boarding. That next the studs is common rough boarding, an inch thick, on which is nailed a peculiar board, called clap-boards, from 4 to 6 feet long, 6 or 8 inches wide, laid lapping so as to expose a weather face of from 4 to 4½ inches, and of a wedge shaped section, about half an inch thick at the lower edge, and tapering off to a feather edge where it is covered. They are planed on the outer surface, to shed rain more easily, but left rough underneath to make a tighter joint.

The frame into which this outer studding is fitted consists of sills, posts, girts, plates and braces, which are all tenoned and pinned together. The sills lie horizontally at the bottom of the wall all round, and the plates at the top, just like any wall plate. Between the sill and the plate are the vertical posts which stand at the corners of the building, and at convenient intervals along the sides. If, as is usually the case, there are two stories, beams called girts run between the posts at the level of the upper floor, those parallel with the floor joists being on a level with them, and those which cross their ends and support them being sunk to receive them. The lower floor joists are cut into the sills, so as to come flush at the top, and those of the third floor rest either on the plate at the top of the wall, or upon plank halved into the upright joists at a somewhat lower level. The junctions of the posts with sills, girts and plates are strengthened by braces, about 6 feet long, tenoned and pinned, as are all the other articulations, with oak pins. The timber is generally spruce or pine, but the sill as being exposed to rot from the dampness of the ground must be of pine. In the north a cellar is dug, and the stone wall carried above the surface of the ground to receive the sill. In the south, where there are no cellars, the sill is supported by posts driven into the ground. The roofs are like all roofs, but covered either with slate, or with shingles of pine or cedar, sawn or split. The sawn lie closest and are warmest, but decay soonest. The split cedar, shaved, are the best. In all cases the rafters are covered with a close boarding, to keep out snow and wind. We have no tiles.

The construction of the inside partitions presents no peculiarity, except, perhaps, this, that we avoid the use of large beams at the floors, to save shrinkage, putting only a two-inch strip of southern pine or chestnut at the top of the studs below, as a partition head, and resting the floor joists and studs of the story above directly upon it, taking care to bring their bearings as nearly over the studs below as possible.

Walls or outside partitions such as I have described, with only the clap-boards, the rough boarding, and a coat of lath and plaster between the air within and the wind without, though generally thought sufficient, are rather thin and cold, and a variety of things are done in the better class of houses to improve them. A layer of tarred paper or felt between the clap-boards and the under boarding is the most common and most effectual device. The under boarding is itself often tongued and grooved. Sometimes brick laid in mortar, either flatwise or on edge, is built up between the joists, but this is not so much done as formerly. It was at one time the fashion to fillet the studs and cut in laths between them, so as to give what was called back-plastering; but the best opinion at present is rather in favour of covering the entire inner surface with a second coat of lath and plaster, separated from the first by inch battens. Any one or any two of these measures—and it is not often that more than two are employed—makes a wall impervious to wind, rain, cold, or heat. The thickness of the walls is altogether between six and eight inches.

In this way are constructed the "shingle palaces," which Washington Irving celebrates, light, cheap, dry, and warm. They are not exposed to any agency that will not equally injure a stone or brick building, except the decay of the sills. This makes very old houses crooked and shaky. But against this we now take precautions, and by giving the sills plenty of air and letting no water get to them, hope to save the buildings of the present generation from decrepitude in their old age. As to fire, isolated houses never catch fire from without, and the wooden house is no more likely to catch fire within than any other. When it does burn, it burns up clean, which is rather an advantage.

It is hardly worth while to go more into these details, which it is difficult to explain without diagrams. The photographs show how the window frames and caps, the cornices, strings and bases, and the corners of the buildings, are finished with joiner's work. They also show how we are trying to introduce, influenced remotely by German or Swiss example, a form of building and a kind of finish, more suited to the material in hand than the classical details employed by our ancestors.

The newer parts of the country are full of extensive and costly buildings, but they do not, so far as I know, present any unusual features, except, indeed, the gigantic warehouses for corn erected in the Western cities. But these can hardly be explained without drawings.

The lateness of the hour prevents my going, as I could wish, into the second branch of my subject—the condition of Architectural Education in the United States, past, present, and future. So far as the present is concerned, indeed, the chapter need be no longer than the famous chapter on the snakes of Iceland. We have at the present moment no system of professional education, young men educating themselves, and picking up in offices what they may, some as pupils and some as draughtsmen, of whom the latter are rather the best off, as it is important to their employers that they should know something, while the pupils, who sometimes pay fees and sometimes not, are left pretty much to their own devices. Any system of regular apprenticeship is quite unknown to this generation, so far as my information extends, except that Mr. George Snell, an Honorary and Corresponding Member of this Institute, and personally known to many of you, has made an effort to introduce in Boston the English usage in this respect, in his own practice, and with valuable results.

The only scheme of education which has existed within my own experience, other than this desultory work in offices, was established by Mr. Richard Hunt, whose name I have mentioned, and who, after his return from Paris, opened in New York an *atelier*, upon the French system, and for four or five years had a small class of students, who enthusiastically pursued, under his electric influence, the study of architectural drawing and composition. A mere private establishment of this sort, dependent upon the energy and devotion of one man, suffered, of course, from the lack of the regulating and sustaining influence which the Ecole des Beaux Arts exerts upon the *ateliers* which supplement it; and Mr. Hunt's *élèves* were, of course, utterly without the systematic instruction by lectures in history, science, and construction, which, to a certain extent, supply in Paris the deficiencies of mere *atelier* education. But he was able to breathe into it what was more important than all this, —the *atmosphere* of the Paris school; and his studio, while it lasted, was a real home of art, a real fountain of inspiration. From this school were recruited many of the younger members of the Institute, who, joining it as Associates, sat at the feet of their elders during their noviciate, and have since ascended to the upper seats.

Some years later than this, finding a good deal of difficulty in obtaining assistance of the sort I needed, I attempted to repeat this experiment in Boston, on a smaller scale and chiefly for my own behoof. Beginning by myself, I soon afterwards enjoyed the powerful co-operation of Mr. Van Brunt, who had been a fellow pupil with me at Mr. Hunt's, and who has, since 1863, been associated with me in my business. Following, in general, the same course that had been followed with us, we endeavoured, so far as other avocations allowed, to add some practical information to this purely theoretical course, and achieved a very satisfactory success, perfectly answering our own immediate purpose, of obtaining a valuable company of auxiliaries, and we accumulated a capital portfolio of drawings made by them during their pupilage, which was quite a show among our friends. It was this success that attracted the attention of the managers of the Massachusetts Institute of Technology, and led to their inviting my co-operation in the Architectural Department of their School, and to the organization of that department, so far as it has been organized at all, in the form it now presents.

I will say but a single word of the nature of this organization and of the character of the work in hand. The architectural classes are a part of a general school of applied science—the only part which touches the domain of fine art; though drawing, as a useful accomplishment and a natural language, is taught in all the departments. In the exercises of these departments the architectural students may learn what they require of mathematics, physics, chemistry, engineering construction, mechanics, and the modern languages. All this work is taken off our hands. Whatever we need for our students can here be supplied. Our own work thus relates only to our own profession and our own art.

In the performance of this work we propose to do nothing that can be dispensed with, leaving matters than can be learned in offices to be learned there, and not encumbering the student with useless and irrelevant lore. At the same time we recognize the fact that many practical matters whose details may best be learned by office work, need a systematic and theoretical discussion for their proper comprehension, and this discussion we propose to afford. We also recognize the architect's need of a liberal culture in his art and extensive learning, at least to the extent of having explored the field it covers, and knowing where to find detailed information. Nor do we consider an acquaintance with the other arts of design either useless or irrelevant, but regard a practical knowledge of what are called the industrial arts, so far as it can be obtained, as being even more serviceable than a technical knowledge of the fine arts, in developing and disciplining the ideas of proportion, harmony, and æsthetic expression, by means of subordination and contrast, upon which architectural composition depends. In historical research and in the study of construction and professional procedure, we propose to treat our classes rather as students than as pupils, leading them, under the necessary guidance and control, to pursue a course of independant study and individual investigation; each contributing to the common stock the result of his labours. The Class of Construction in the Architectural Association, a society which, if I may say so, seems to be doing more for professional education, than any agency now at work in the kingdom, affords an example of the application of this co-operative system, which I have observed with the greatest interest and satisfaction. Its continued success will afford to our own undertakings the greatest encouragement.

The constant practice of design, which, when the topics chosen and the data given are suited to the student's state of development, seems to be the most efficient and wholesome, as it is undoubtedly the most stimulating method of study, we propose to employ with great freedom, not only as an exercise in modern architectural composition, but as an auxiliary to the study of the history of the art, just as boys compose in Greek and Latin to perfect their acquaintance with those tongues. In these exercises, competition rather than co-operation comes naturally into play, and we propose to establish real or nominal prizes, as circumstances may determine, as an incentive. The occasional delivery of special lectures on special subjects by persons specially qualified to treat of them, is the only remaining feature of the plan that need be mentioned. By these lectures as well as by our collections, and by the accumulation in the course of time of much valuable information, we hope to be of service not only to our own classes, but to the profession at large and to the general public.

Of the personal material with which we have to deal, I will only say, in conclusion, that besides drawing in the pupils and draughtsmen and assistants already at work in offices, we shall have students devoting their time exclusively to the school, and pursuing a stated curriculum within it. The increasing number of young men of liberal training and culture, who of late years have turned their attention to architecture, (a band that would have been much larger than it is, there is reason to believe, had any satisfactory means of education been open to them), gives cause for the most satisfactory anticipations in this regard.

I have laid upon your table a copy of a pamphlet, explaining in somewhat greater detail the ground this school proposes to cover, and the principles by whose guidance we propose to fashion our educational structure. A portion of this paper Mr. Godwin has done me the honour to re-print, in the June number of the *Builder*. To collect the materials for this structure, the photographs, casts, prints, books, business documents, drawings, and sketches, which must form our educational apparatus,—or to learn where they can be got, to perfect our plans by the study of European Schools of Art, and to chasten our judgments and correct our aims by the counsel of men whose insight or experience fits them to be our counsellors,—this is the quest which brings me to your shores, and has directed my footsteps to your door. We need the best advice and information, as well as good apparatus, to enable us to set out upon our path with confidence and pursue it with a reasonable assurance of success. For the valuable suggestions and sagacious counsel I have already enjoyed, I cannot too strongly express my obligations.

Sir Walter James (having been introduced by Mr. Donaldson, and admitted by the President as an Honorary Fellow of the Institute) expressed his high sense of the honor that had been conferred upon him. He said he had listened with great gratification to Mr. Ware's address. He thought it worthy of note that that gentleman should have come over to this country to take notes here, and to elicit information as to the state of the architectural education in this great metropolis. He felt that a great compliment was paid to this Institute and to the architects of England by the circumstance; and he considered whatever instruction they were able to give Mr. Ware would in the course of a short time be amply repaid to them by the reflected light which would be returned to them from that new continent, where, to use that gentleman's own phrase, architects have, perhaps, rather a freer swing than was the case in this country.

Mr. T. L. **Donaldson**, Fellow, said, that but for the lateness of the hour they might have wished to have elicited more information than they had received from the simple, unaffected and plain statement they had heard from their American colleague. Nothing, he was sure, could be more agreeable to their feelings than these opportunities of giving a welcome to their professional friends, from whatever part of the world they came—more particularly those who held the relation of brethren both in blood and feeling. It was with great pleasure they had received among them Mr. Ware, and listened to the explanations and information he had given them. They were indebted to America for many notions. Possessing in a large degree the genius of invention, that nation had perhaps shown greater aptitude in the improvement of the inventions of others, as well as great intelligence in the application of them to the necessities and purposes of life. The finer arts in connection with architecture did not appear as yet to have been cultivated as they deserved in America, because the first necessities of a people had to be supplied before attention could be paid to the higher refinements of the human mind; but it was now found that their American brethren were coming forward in this respect, and there were numbers of their fellow-countrymen studying in Italy, particularly as sculptors, and those who had already studied there had distinguished themselves by their productions exhibited in this country, for which we had given them all honour. They must all be gratified at seeing the energetic movement now being made with reference to the architectural education of the young men who would hereafter enter into the profession. There was no question that elementary principles were necessary; but it seemed, as in Europe so in America, there was a great notion of leaving genius to itself, untramelled by the theories of a by-gone age. America possessed many fine architectural monuments, and he trusted they would improve themselves by an adherence to those rules of previous centuries which had produced the buildings of which this country and Europe generally boasted. He was sure they had all been greatly interested by the communication Mr. Ware had made to them in so simple and unaffected a way, as well as gratified by the warm interest he had manifested in the proceedings of this Institute. He begged therefore to propose a cordial vote of thanks to Mr. Ware for his highly interesting communication.

Mr. M. **Digby Wyatt**, Fellow, said it was with feelings of great pleasure he rose to second the motion. They must all have been greatly interested in the picture of American art, and the early struggles of that art, which had been laid before them; and they could not fail to have been struck with the technical dexterity at which the Americans had displayed in the structural use of wood, iron, and stone. It was from that cause, as well as from the educational course which Mr. Ware was endeavouring to bring forward, that he augured a successful future for American art. But there were two great stimulants which that country possessed in a great degree, and must lead to genius—urgent requirements on the one hand, and on the other enormous wealth and unbounded resources. These were incentives to good art, and would constantly manifest themselves in a more powerful form. If we were to look upon America in future as a great commercial head, we must also look to her, like Florence of old, for the development of the arts which she possessed. What might have been even more interesting, he thought, than the narrative of these early struggles, would have been some definite account of the way in which the great monster Necessity in America was supplied. He would have liked to have seen the plans of the great hotels of the country, and an explanation of their working and administration; as also of the great stores and warehouses which Mr. Ware had spoken of, the details of construction of the floors, &c., and the extent to which the fire-proof system was adopted. Those buildings in Cincinnati and Philadelphia were carried out upon an enormous scale, and far surpassed those of London. He would have liked to hear how they had met difficulties which must assuredly have been encountered with ingenuity. He hoped if Mr. Ware favoured them by appearing before the Institute again, he would come prepared with information on these interesting points. At the same time he (Mr. Wyatt) felt very grateful to that gentleman for his communication this evening, and he was delighted to hold out the hand of fellowship to him and other brethren of the profession who might arrive here from that country.

Professor T. H. Lewis said, having had the pleasure of seeing a good deal of Mr. Ware since his arrival in England, he would bear witness to the assiduity with which that gentleman had prosecuted the objects he had in view; and he (Professor Lewis) was satisfied, from what had passed, that their visitor would carry back with him to America pleasing recollections of his sojourn in this country. The point on which, if time had permitted, he should particularly have liked to have heard a more detailed explanation, was as to the system of architectural education proposed to be adopted by the different Institutions, more especially that with which Mr. Ware was personally associated. He could only unite most cordially in what had fallen from the gentleman who preceded him, and join most heartily in the thanks accorded to Mr. Ware.

Mr. George Godwin, Fellow, said, as it was his privilege to make the first address of Mr. Ware known to English readers, he was glad to be able to add his humble tribute of thanks to that gentleman for his straightforward and interesting statement. The names he had mentioned had no doubt recalled many interesting circumstances to the minds of many present. It was gratifying to find that men known to them a few years ago were now acting so good a part in America. The portrait of Mr. Walter which Mr. Ware had brought with him particularly affected him, because he had had the pleasure of that gentleman's personal acquaintance during his visit to England soon after he had completed the erection of the Girard College. He had had the pleasure also of considerable correspondence with another gentleman mentioned—Mr. Downing, at the time of the publication of his work on Landscape Gardening—a book which had done great good in America. He concurred to the fullest extent in the hope expressed by Mr. Wyatt that Mr. Ware would, in some form or other, favour them with further details of the modes of construction adapted in the buildings of America, as he was sure it would be a great advantage to the Institute to be in possession of those practical points.

Mr. C. F. Hayward (Hon. Sec.) would say one word with respect to the Institute, with which Mr. Ware was connected, the Institute of Technology at Boston. One great feature in the course of instruction in that Institute was, that while a four years' course was required, the first two years were devoted rather to general than technical education; but from the first not only mechanical but free-hand drawing was made a necessity. An institution which embodied that among its general requirements was, he thought, deserving of particular mention, because he thought none of the institutions of the present day sufficiently recognised the importance of drawing as a branch of education.

The President said, he was sure the proposition of thanks to Mr. Ware would be received with acclamation. He would only trespass with one remark, which he was sure Mr. Ware would take in good part. They had listened with great interest to Mr. Ware's narrative of the gradual development of architecture in America, and the recognition of its professors; they had also heard with pleasure how the kindred art of landscape gardening had been fostered there, and fostered as (the President) always considered it should be, as a branch of and connected with architecture, a thing which in England they had too much lost sight of. He would invite Mr. Ware's attention to one point, and would ask him whether there was much hope that architecture would hereafter be called in, as it had not been before, in the planning of the American streets, so that the too prevailing monotonous plan of rectangles and squares would be abandoned in favour of some more natural methods of laying out towns? The radiating plan, of which Washington was a distinguished instance, did not exist, he believed, in any other city north or south, which were, like New Orleans and the new parts of New York and Boston, laid out uniformly on the rectangular plan. That system of planning towns was most distasteful and disadvantageous to the proper appearance of the public buildings of these towns; and he was sure if the American Institutes, with the intimate knowledge they possessed of the susceptibilities and tendencies of the country, would direct attention to the advantages of the radiating plan, so as to make the great public edifices the principal objects, it would give a great impetus to the growth of architecture, of which they had already seen such vigorous young shoots.

The vote of thanks having been passed by acclamation,

MR. WARE expressed his acknowledgments of the kind way in which his crude and inadequate remarks had been received by the meeting. With regard to the points raised by the President he would say, he felt that architecture and landscape gardening, in connection with each, were more likely to have way than had hitherto been the case: and with respect to the planning of towns, although Washington was built upon the radiating plan, it was considered one of the most inconvenient cities in the United States, in regard to strangers finding their way about. Of late, architecture in connection with landscape gardening had been called in aid, in laying out not new towns, but new parts of towns. With regard to fire-proof construction in America, the plan was that which was familiar in this country of wrought iron girders and brick arches. With regard to the remarks that fell from Mr. Hayward and Prof. Lewis he assured them it was at the sacrifice of personal feeling that he had put the Institute with which he was more intimately connected in the background, and had placed the American Institute of Architects in the more prominent position. He thought, coming here as he had done, it was best to touch upon those subjects which were likely to be of most interest to them, rather than advance any personal views of his own, or the objects he had most at heart.

The meeting then adjourned.

ON THE PHOTOGRAPHS TAKEN FOR THE ARCHITECTURAL PHOTOGRAPHIC SOCIETY FOR THE YEAR 1866.

By Edward W. Godwin, F.S.A., Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, February 11th, 1867.

When our Honorary Secretary, Mr. Seddon, asked me to give to this Institute a paper on the Photographs which have just been issued by the Architectural Photographic Association, I assented more readily than my fitness for the task warranted,—first, because it would enable me to observe the rule that every Fellow should contribute some work, original or otherwise, on his election; secondly, because it would afford me an opportunity of offering my testimony to the very valuable labours of this Association; and thirdly, because, knowing too well the difficulties Honorary Secretaries have to contend with, it would have been very hard for me to have refused compliance with Mr. Seddon's request, even had he not made it impossible for me to do so by the very courteous terms in which he expressed it. The work which our Photographic Association does annually, is one of great interest, and it is of the utmost importance that it should be rightly understood and appreciated by those for whose special benefit it is intended;—it is scarcely necessary to say that I mean the Architectural Profession, and the students who are preparing to enter it; nor should I omit to mention the Art workmen, for it is manifest that their ability must be in proportion to their knowledge. But as it is impossible that they should visit a tithe of the places where the best examples of ancient art are to be seen, they must be, for the most part, dependent upon the copies which are brought to them; and if these are not accurate—embodying the spirit as well as the form—it will be small wonder if their work, whilst pretending to be founded on the past, is utterly lifeless, and at fault in nearly every particular. Of course it would be better if Art workmen could study from the originals; the benefit from such a course is very remarkable. I remember taking a carver over to Chartres, for one day only, and pointing out to him the delicate work of the north and south portals, with a special reference to the excellent way in which figures and foliage are there combined. The man had never before been out of England, and it was extraordinary how, in the few hours spent in merely looking at the treatment, without making a single sketch, he managed to extract sufficient of the spirit of the old workers to produce a very creditable series of foliage decorations in a building I had then in progress; but of course this is not always practicable. It is, therefore, of the last importance that we should have transcripts of the closest accuracy to place in the hands of artizans, as well as for our own purposes, and I know no means of obtaining these which can for an instant compare with those offered us by the Architectural Photographic Association.

Believing that the labours of the Association have not as yet been appreciated at anything like their proper value, I have thought that it might not be altogether unpardonable, before attempting to make any comments on the photographs now before us, if I trespassed a little on your patience by reviewing briefly what the Association has already done. At first, the photographs issued to subscribers were merely selected from the trade stock of photographers, and, consequently, there was nothing very special or very difficult in the work, but in 1862, the real distinctive character of the Association was set forth for the first time, in a series of thirty-five photographs from the sculptures of Wells Cathedral, taken specially for the Association. These photographs, with the exception of a general view of the west front, gave us to a large scale the small groups which occupy the quatrefoils and half quatrefoils over the lower arcade, and thus studies of very great value were offered to that host of so-called Art workmen, who have the audacity to attempt figure subjects before they have given one thought worthy the name of study to the human figure, in nature or art. The money consideration was next to nothing, for the price of one of those spiritless capitals we see everywhere would have been amply sufficient to have made its carver the happy possessor of the entire series. What advantage the "Architectural Sculptors," as they are called, took of this first offer of the Association I cannot tell, but judging from their latest works, I should say the value of these photographs had certainly not diminished, and that the best of our Art workmen may still humbly reverence the marvellous skill and exquisite feeling manifested in such a figure as that of Eve labouring, and may yet study to his advantage the carver's art as exhibited in every group. Since the issue of the Wells series, sixty-four photographs have been specially taken for the Association, and but for the loss we all suffered in the death of William Lightly, Fellow of this Institute, no doubt this number would have been increased by one-third more; as it is we have a blank year in 1865, which must ever remain a melancholy void as we look at the results of his brief but indefatigable labours. Under his management in 1863 and 1864, twenty-two places were visited; the 1863 series, which included Arles, Auxerre, Bourges, S. Gilles, Lyons, Sens, Tarascon, and Vezelay, was essentially a "portal" series, eighteen out of twenty-two photographs being devoted to doorways, and one or two details of doorways. In the selection for 1864, sixteen out of twenty are general views, and although those of Nogent Les Vierges, Mogneville, Agincourt, and the Chateau of Pierre-Fonds are among the most interesting of the whole collection, still I cannot help thinking that it was scarcely worth while to obtain two views of such a Church as Cires les Mello, or any view at all of such a weak piece of architecture as Luzarches, and yet it almost seems ungracious to take exception to anything in that series, which possesses the two splendid photographs of the sculptured choir screen at Amiens.

I have said that 1865 was a blank with regard to the issue of photographs, but the Association was not altogether idle, for it accomplished that very important work known in trade as "taking stock," the result of this stock-taking showed that the three years' labours of the Society were not what may be called financial successes. The great body of architectural students and the art workmen were either ignorant of the existence of the Society, or indifferent to the good things which it offered them. Possessing only a few hundred subscribers instead of at least a thousand, it was not surprising that the Association found itself in debt, with no property beyond a stock of photographs, that might have been quoted in the market as very much the reverse of "lively." It was at this juncture of affairs, that Messrs. Cundall and Fleming, photographic publishers, came forward and kindly offered to relieve the Society of the old stock, its debts, and all trade responsibilities for the future,—the Society reserving only its power of direction as to the choice of subjects. There can be very little doubt, I should think, that this arrangement was a judicious one for both sides; at the same time, the work of the Committee being now limited entirely to the all important question of selection, subscribers will very naturally expect that this department will be managed in such a way that the confidence of the art public may be firmly established, and criticism disarmed.

At the risk of being thought hypercritical, I must ask leave to point out where I think the work of selection has failed in the photographs for 1866, which are now before us. We have had, in 1863, a group of portals, and in 1864, a collection of general views, and now we have a half-and-half series, made up of general views and portals, with here and there a detail to anything but a large scale. In each of the selections for 1863 and 1864, we had two capital examples of Domestic architecture (a half-timbered street house, a castle, an Archbishop's palace, and a *salle synodale*). I was not alone in accepting these as earnest of future labours in a like direction, and I confess I was not a little disappointed in finding domestic art entirely absent from the selection for 1866. Again, west fronts, general views, and portals, are not the only things worth studying. It is quite true that a collection of good photographs of all the chief portals or west fronts, would enable the art critic, at a glance, to compare one with another, and save him from falling into those egregious errors into which he is not unfrequently led by treacherous memory, and equally treacherous sketches and engravings. But the work of the Association is primarily, I take it, not for the gratification of the art critic, nor the archæologist, nor the amateur, but for the help of the working art student, and therefore until a mania for cathedral building sets in, it may be possible to select subjects of greater practical utility for present needs, than those grand richly storied portals, any, even the faintest, approach to which it would be absolute nonsense to anticipate in an age like the present. Then, too, although such west fronts as those of Civray and Notre Dame de Poitiers are exceedingly valuable to the practising architect as well as to the archæological student, still it may be open to question whether it was worth while to give two views of the same front, when so much remains to be photographed, and the mania for restoration is so strong. Here, as an antiquary, I am almost tempted to bring my fault-finding to an end, but as an architect, and in spite of the historical value of having faithful representations of dated buildings, the selection of such a church as S. George de Bocherville seems to me altogether unworthy the Architectural Photographic Association; especially, too, when in the same series we get only general views of the west end and interior of S. Pierre Lisieux, and think what we might have had if the camera had remained at Lisieux instead of being taken to Bocherville.

Putting this last-mentioned church, then, out of the question, the series now exhibited may be divided into three historical groups:—1st, Romanesque; 2nd, the first Pointed; and 3rd, the Flamboyant. In the first group, we have (10 and 13) a south-west view and the façade of Notre Dame, Poitiers; (14, 15, and 16,) the west doorway, with details of S. Ours Loches; (5, 6, and 22,) west views, with details of Civray; (17 and 18) south doorway with details of Le Mans Cathedral; and (4 and 11,) the western doorways of Chartres Cathedral. Certainly the admirers of French Romanesque, and what I may perhaps be excused for calling the *muscular* architects, have every cause this year to be grateful to the Association. Taking this group first, perhaps the most important contribution are the two photographs of Civray (numbered 6 and 22 in the list), the third view of Civray (No. 5), as I have already hinted, is of very little use, and is, moreover, a cloudy photograph. It is almost superfluous to say that the chief point of interest in such a façade as that of Civray, is the iconography. Apart from its sculptured detail, the work is remarkably simple,—the general composition consisting merely of an arcade of three arches; a strongly marked corbelled string course, or cornice; another arcade of three arches; a repetition of the string course; and a plain parapet. In this architectural framework it will be observed that the central arch in each arcade is the narrowest, or just what it ought not to be; and this irregularity is made all the more prominent, by the addition of a moulding to the upper arch, and two complete orders to the lower one. It should be remarked, that whilst the lower arcade is considerably strengthened, and, as it were, bound together by extending, wherever practicable, the bold abacus of its clustered shafts, the upper arcade is lightened through having its abacus interrupted at each pier by a large projecting shaft, which, by being continued to the parapet, further enforces the vertical principle, and relieves, to a considerable extent, the stunted proportions of the upper half of the façade. In the north or left-hand arch, the depth of shadow under it being so much greater than that under the others, is owing, not only to the wall being further recessed, but also to the arch itself being in advance of the line of the front; the photographs show very clearly the differences in plan of pier capital and archivolt, between this compartment and the others, and the evidence of its later date is very manifest. The great charm of Civray, however, is, neither its construction nor its history, but its decoration. Now the sculptured work on the doorway, and the centre and right-hand arches of the upper arcade, are very different from the work on the other three arches. From certain fragments in the doorway, there can be little doubt, I think, that the whole of the original work was executed, or intended to be executed, in the square low-relief Byzantine fashion of the side arches of the lower arcade, the complete development of which we see in the church of Notre Dame, Poitiers (Nos. 10 and 13). The photographs are sufficiently clear to show us at a glance the later date and finer feeling of the figure sculpture in the archivolts, as compared with the rest of the work. The subjects are somewhat interesting; in the central compartment of the upper stage we have six *virtues*, triumphant over their opposing *vices*. The virtues are represented as knights, possibly templars, for they wear long flowing mantles, and have upon their pear-shaped shields the templar's cross; there is no sameness about the group, and each figure is marked by a grandeur of action which is well worth the modern sculptor's study;—note especially the upper figure to the left. In the right-hand compartment, the figures of the twelve apostles are placed diagonally on the archivolt, and the artist has consequently been able to get them larger than he could have by any other arrangement; but even with the advantage thus gained, and the greater span of the arch, one cannot help feeling that the difference of scale between the two sets of figures is a mistake. This difference, however, would not have been so marked, had the figures been arranged as in the angelic choir of the left-hand arch, where demi figures of angels issue from circular medallions. In the sculptures of the doorway, we have, beginning at the outer order;—1. The signs of the zodiac and the months; 2. Six angels,—the disposition of the wings and heads very lovely; 3. Ten figures, five on each side of a demi-figure of Christ; 4. Four angels censing below a demi-figure of the first person of the Blessed Trinity; and finally, in the tympanum, Christ as judge in an aureole, surrounded by the Evangelistic emblems, this last being an exceedingly bad "restoration."

Notre Dame, Poitiers, is one of the pet churches of the admirers of Romanesque architecture, and not without good cause, for there are few buildings which show more completely the full development of a style which, however much it may lack, has at least a manly breadth and vigour about it,—barbaric if you like, but a barbarism which is far more attractive and refreshing than the light and elegant productions of later times, spoilt as they so often are by a frittered detail. Viewed as a piece of iconography, this front is less interesting than that of Civray, but as a piece of architectural composition, it is far more important. The clustered shaft buttresses of Civray, at the angles, are also found here, but with bolder proportions, and corbelled out at the top so as to form circular turrets, good in themselves, but exceedingly awkward if not positively ugly in the general composition. As high as the first string course the design is very free from defect, if we except what may be regarded as an excess of strength. Above this string course the design, even when we allow for the restoration of the circular window, and the completion of the smaller arcade, is manifestly out of all proportion with the lower part. The limits of this paper will not allow me to speak at any length of the mass of carved work with which the façade is encrusted,—there is scarcely a corner which does not possess a detail worth study. Among these, I may call special attention to the animals in the capitals, those on the tympana of the small arches each side of the doorway, and also those under the string course. In the examples from S. Ours Loches, the animal carving is very coarse and barbarous, and unworthy the amount of attention which the Association has thought fit to bestow on them. The foliage work, seen in photograph No. 15, is, however, just as good as the animals are bad, and it is very interesting to compare the almost classic refinement of the capitals of the doorway with the coarse conventional treatment of the animals in the same series of caps, and the foliage in the capitals of the vaulting shafts. Classical tradition is also strongly preserved in the capitals of the south doorway of Le Mans Cathedral, shewn in Nos. 17 and 18, where not merely the foliage but the construction of the capital is essentially Corinthian. Some of the abaci are, however, carved with a coarseness which is very discordant. The dragon work of the abacus to the extreme left, is a noteworthy exception. Particular notice should be taken of the reveal of the doorway, as it is a specimen of strong pure Romanesque conventional carving. It has been illustrated more than once, but it was reserved for Messrs. Cundall and Fleming to give us the best possible representation of it, both as regards point of view and photographic clearness. All the figure work, save only the central one to the right of the doorway, are below the mark (those in the arch very much below); not only are they bad in themselves, but they are badly grouped, and the only satisfaction is, that the photograph is happily dark, and does not bring out their defects too prominently. The photographs, Nos. 4 and 11, which so well illustrate the western portals of Chartres, bring us to the end of the Romanesque group, and lead us by an easy transition to the first Pointed series. Simple in *motif*, well proportioned in their mass, and rich in their sculptured decoration, these doorways stand unrivalled amongst all the works of the age to which they belong. Had the upper horizontal line of the side tympanum been continued through the central one, so as to preserve the horizontal principle, and at the same time reduce the scale of the central subject, which appears to me just a trifle too large for the rest of the work, there would be little left to find fault with, unless indeed we objected to the whole principle of the decoration. I shall not now pause to enquire what may be said for or against the unequal distribution of the figures in the jambs, the way in which they are, so to speak, stuck against the shafts, the application of figures to the curve of an arch, thus bringing them into all kinds of angles with the horizon, or the use of figures in the same composition of such widely different scales as those here employed. For myself, I must confess that nearly all the great foreign portals seem to me to be spoilt by an excess of figure sculpture, and although such an objection is rather like grumbling at the fruit in a Christmas pudding, yet, from my experience both of puddings and buildings, I should be inclined to say that it was quite possible to spoil both the one and the other by too many plums. And again, although I may run the risk of being told that I lack reverence, yet, in behalf of what Mr. Ruskin calls temperance in art, I certainly think these doorways would have gained by the omission of the diminutive figures in the capitals, which, stuck round the bell with their feet on the neck-moulding, present a doll-like and unsatisfactory appearance.

We now come to three of the finest if not *the* finest photographs yet issued by the Association,—Nos. 1, 2, and 3; 1 and 2 illustrate the north, and 3 the south portal of Chartres. The transparency of the shadows, the wonderful clearness of the detail, and above all the grandeur of the subjects, are almost sufficient to paralyse criticism, and make us pause in silent reverence and astonishment. There are three or four dates in the history of this noble church which are valuable as explanatory of certain irregularities and differences about these portals. In the year 1194, the church was destroyed by fire, it was rebuilt in the first Pointed style, and consecrated in the year 1260. Twenty years later, the sculpture of the transept porches was in an incomplete state,—later still, in the fourteenth century, the artist was still busy with his chisel, and to this day the work remains in an unfinished condition. The south portal is at once the earliest and the most complete of the two; the inner arches in both are much the same in point of date and design, but in the outer arches, although the general composition is pretty much alike, there is a very noticeable divergence in construction and detail. Thus, in the south portal, the shafts rise from *quasi* classic pedestals, in the north they rest on a boldly moulded base or plinth course. In the south, the piers themselves are simple in plan, and systematic in arrangement; in the north, they are larger, more complex, and of a compound character,—carved and canopied; the lower part of the shafts at the entrances to the portals being wrought into elaborate and somewhat remarkable pedestals, sustaining statues arranged sufficiently in advance as to appear to be independent of the shafts behind them. Again, the piers which support the side south portals are of solid square masonry, relieved by angle shafts, and six tiers of small groups of sculpture under canopies. In the north, the piers which answer to these, are pierced so that there are three groups of shafts instead of one group and a square pier. In the north, there are two rings of statues to the outer arches, the inner ones seated, the outer standing; whilst in the south there is only one ring, and that in the proportion of five to the side, and seven to the centre arch, instead of seven and nine. In the north vaults, the ribs are enriched by figure sculpture, whilst in the south the figure decoration is in the vaulting space, between the outer arch and the first rib. And, finally,—not that I have by any means exhausted the differences, the carving to the south is of the most delicate and lovely conventional type; but that to the north is partly conventional and partly natural. Altogether, then, it seems to me, that the north portal shows not only the latest work, but a desire on the part of its builders to improve on the south; how far they succeeded, will, of course, be mere matter of opinion; but I think the double order of the outer arches, and the hood moulding, give a certain strength and emphasis to the work, which is sadly wanted by the southern arches, whilst, owing to the very incomplete state of the north portals, the south composition has the advantage, by reason of the imposing canopies which crown the summit of the piers. Of the design and execution of the details of both porches, it is almost impossible to speak too highly. Taken together, they furnish a perfect museum for the architectural sculptor, and it is much to be hoped that the Association will not be satisfied with giving us only the three photographs in this year's issue, but that they mean them as an instalment of further labours in the same glorious field. Tempting, however, as these details are, I must pass on to the photographs which remain to be described. Nos. 7 and 8 give a west view, and interior of the church of S. Pierre Lisieux. No doubt this church has many admirers; to myself, I must own it is somewhat disappointing,—there is an awkward junction between the second and third stages of the towers, and a certain slight and reed-like quality about the elongated shafts, which is anything but pleasant. Lisieux, however, possesses a gem with which most people are familiar; the praises of which, too, Mr. Ruskin has so ably set forth in the "Seven Lamps of Architecture;"—I mean the doorway of the south west tower. It is true the view just shows this doorway, but only enough of it to make us long for more; and I, for one, would gladly have spared the interior of the church, for a full-size photograph of this small but exquisitely lovely portal. I am not in the confidence of Messrs. Cundall and Fleming, so as to be able to state whether their photographer has had the consideration to secure a negative of it, but, whether he has or not, it is much to be desired that many years will not pass by before we shall be put in possession of one or more illustrations of this marvellous specimen of fully developed thirteenth century art.

We come now to the last group, wherein is set forth in four photographs the wonders of the Flamboyant style. In No. 20 we have a general view, and in No. 9 a nearer view of the west end of the Abbey Church of S. Riquier. What I have already said about the extra view of Civray, applies equally to S. Riquier. No. 20 really gives us nothing that we do not possess in a much better form in No. 9, except the top of a tower, very bad in composition, and utterly deficient in finish. It will be observed that the greater part of the west front of S. Riquier is made up of a shallow porch, which rises to the base of the belfry, or, in other words, the whole height of the church. The top of this quasi porch is finished by a horizontal parapet, in line with that of the nave, and if this principle of construction had been attended to throughout, some unity would have been secured in the now disjointed mass, and there would have been less opportunity for such wild riot of ornament, and such intemperance of line as are displayed in this remarkable façade. But, as in all riot and intemperance there are times of comparative calm, which only tend to bring into greater relief the ungovernable excesses, so here, in the wrought stone-work of this Abbey Church, the turrets and the upper stage of the porch, though scored all over with long lines of wearisome mullion, are yet so quiet and unassuming in character, that they give to the rest of the work a prominence it by no means deserves, and thus by this irregular and unequal disposition of ornament, is made more patent the weaknesses of the style. It is surely unnecessary for me to point out these weaknesses, or call attention to the pie-crust cusping, placed at an angle with the face of the work; the thorny foliage; the pinched-up tracery; the lumpy and over-wrought figure sculpture; or to those strange and awkward panels formed by the hood mouldings over the doorways; and yet, patent as all this may be, and in spite of all the excesses and vagaries which this strained style must possess in the eyes of all sober-minded critics, there are, nevertheless, features of such elegance and such lovely proportions, that the most muscular architect and the warmest advocate of Romanesque art must perforce admire them. Take, for example, the delicate gradation of the turrets, and the porch buttresses on which the tower buttresses rest; the exquisite grace of the canopies in the porch buttresses; and last, though not least, the general proportions of the central doorway.

Very different in its ordered sobriety and careful distribution of ornament from both the other examples of Flamboyant work, is the powerful and well-proportioned composition of the western portals of the Cathedral at Tours, shewn in No. 19. In detail, this is one of the least interesting of the photographs yet issued, besides which the great statues have disappeared, and a general restoration has set in, frost-like, upon the whole. All this, however, deplorable as it may be, has its bright side, for it enables us to give our undivided attention to the general design. Here, it will be observed, we have the horizontal and the vertical principles happily combined. The pedestals to the chief niches,—the broad decorated band of the chief canopies continued round the buttresses and through the jambs of the doorways; above these the strong string course of the buttresses, where the square changes to the octagon, with its advanced open pinnacle work; and, finally, the parapets with their cornices passing through the gables, bind the portals together, and give emphasis where emphasis is needed. On the other hand, the vertical principle asserts itself with all temperance in lovely gradation of strength and delicacy combined, where the four great buttress piers give, without any appearance of effort, their support both constructionally and artistically. The one great defect of the general design, at least to my mind, is the filling in of the tympana by masses of window tracery, a fashion, however, so completely belonging to the style, that the architect of Tours can scarcely be blamed for it, when he has avoided so many other errors, and exhibited so much real excellence.

The last photograph (No. 12) represents the western portals of the Church of S. Wolfran Abbeville. Ill-proportioned in its general mass, weak in its lines, crowded to excess with meretricious and over-laboured work, having thin reedy mouldings and sprawling tracery, shewing a restlessness in the disordered variety of its panelled patterns, and full of harsh contrasts, it is chiefly valuable as a danger-signal, to warn young architects from running into the error of supposing that buildings can be treated like pastry, and cut up and down like an Elizabethan apple tart.

And now, having said my worst, it will not, I hope, be considered a mere matter-of-course compliment, if I take this opportunity of offering to the Association my hearty congratulations for the work which they have accomplished during the past year; we know how much remains for them to do, and, knowing this, we are brought face to face with their one great difficulty,—*the difficulty of selection;* on this point I would only add, how pleased most of us would be if photographs of such details as the capitals of the transept portals at Chartres, could be obtained for us. I am quite aware of the difficulties, and that to take a negative of the capitals just mentioned, would be a very different sort of thing from taking one of the capitals of S. Ours Loches;—but could not these difficulties be overcome?

In conclusion, I cannot help feeling some regret at having so soon to take my leave of these photographs. To have lingered over the earlier portals,—to have indulged in comparisons between the south doorway of Le Mans, and the west central doorway of Chartres, and to have examined in detail the wonderful iconography of the last-mentioned cathedral,—its marvellous pictures of the months and the seasons, of virtues triumphant, of heavenly choirs, of solemn symbols, and of sacred stories,—delightful as it would have been—was scarcely compatible with the limits of an ordinary paper. Then, on the other hand, to have taken the antiquary's point of view, and marked the subtle distinctions of style and date, not only between different buildings, but between different parts of the same building; to have separated the later from the earlier work; to have noted the influence of the earlier art upon the later re-buildings; and to have traced the development of sculpture through all the periods of Mediæval art, from the stern conventionalism of Civray, to the affected naturalism of Abbeville,—so admirably exhibited in this series of photographs, however interesting it might have been, would have carried me far beyond the time allotted to me. I have chosen rather to take another course; and to endeavour, by a few critical notes, necessarily slight and brief, to enlist more sympathy in the work of the Association, and to suggest that sort of critical examination, which gives us at the same time the greatest profit and the truest pleasure, by reason of the exercise of *thought*, so that our judgment, accepting nothing for granted, may not fall into the extravagant admiration which used to characterize one school of architects, nor run into the opposite extreme of blindness, which was once so notable a failing of the other school.

Mr. A. B. Phipson, Fellow, enquired whether these photographs were likely to stand the test of time. He had subscribed to the Association for two or three years, but he found many of the photographs furnished during that period had very much faded, some being now little better than white paper. It was complained that architects, as a body, did not support the Association as they ought to do by their subscriptions, but he thought many had been influenced in withdrawing their subscriptions by the same reason as himself, viz.—a fear that the photographs would not last for any length of time.

Mr. Seddon, Hon. Sec., asked whether the fading had taken place in the photographs furnished before or since the re-constitution of the Association, inasmuch as previous to the arrangements under which the photographs were now supplied, the Association was dependent, in a great measure, upon local photographers for the execution of the subjects selected. He could say that out of the seventy or eighty subjects which he had in his own possession, there were very few which indicated any appearance of fading, and he could add that none of the subjects issued since the new arrangements had been made were any worse in that respect than when he first received them. He would take this opportunity of expressing his hope that the members of this Institute would support the Society, principally for their own sakes, although it was desirable to do so for the sake of the Association itself, as it would enable even more to be done than was now suggested. It seemed to him that the service rendered by this Association was very great. For example, to have obtained such a series of photographs as that which illustrated Wells Cathedral was an important step, though he was sorry to add that they were not appreciated as they deserved to be. He would mention that the series both of Wells and of the examples of parish churches could be obtained by intending subscribers. The difficulty of selection of subjects was in the *embarras de richesse*. Irrespective of innumerable existing objects of interest, there were many subjects to be found in the British Museum. No doubt some of the most valuable MSS. could be obtained for the purpose of being photographed. It had been contemplated to send photographers over to Paris, to take selections from the interesting objects in the Museum of the Hotel de Cluny, but the Society wanted more support. They wanted the support of numbers, and until that was obtained they hesitated to embark in those arrangements which would enlarge their operations and render them more valuable to the members of the profession. Mr. Godwin had borne witness to the great value of the series now before them, issued by the Society last year. On behalf of the present photographers of the Society, Messrs. Cundall and Fleming, he would say there was sometimes great difficulty in procuring proper representations of the subjects selected. They could not always get the points of view they wished to have, owing to some other building being in the way. There were, in fact, many practical difficulties to be encountered. The Association would be very thankful if subscribers who came across any subject of special interest and value, would communicate the fact, in order that, when possible, arrangements might be made for its being photographed. It was obvious that nothing more than general directions could be given to the operators, but the specimens now before them afforded ample evidence that they were learning by degrees the work required of them, and they might expect progress in this respect every year.

Mr. E. B. Lamb, Fellow, remarked that at the present time photography was in its infancy, and that they could hardly reckon on the durability of photographic views. He was sorry to say many of his own had faded. No doubt they were valuable things as studies of architectural details; but, unfortunately, the facility with which photographs could be obtained, led architects, and especially the younger ones, to neglect too much the pencil and sketch book. The pencil sketch was a permanent thing, and was always useful, not only for their own reference, but for the reference of future generations; while he was afraid that the photographs which adorned their walls, and looked so well now, would, in the course of another generation, be little else than blank paper. In his younger days he used to fill his sketch books, and he looked upon them with great interest now, because they contained records of buildings which he had studied many years ago; but he was afraid photographs would hardly endure so long. When architectural students went to a town to see an old church, they were apt to go to a shop and purchase a photograph of it. They did not draw as much as they used to do. He could advocate photography so long as it was not carried on to the neglect of that most important branch of their art—sketching.

Mr. J. A. Hiscocks, Fellow, in corroboration of Mr. Lamb's remarks with respect to the fading of photographs, said that even when they were kept in portfolios, or in cupboards, in well-aired and ventilated rooms, damp affected them to a much greater extent than ordinary drawings. He was, himself, an early subscriber to the Association, and he would state that his specimens had not faded at all. He agreed with Mr. Lamb that it was a great temptation to neglect sketching when they could obtain what they wanted by means of photography with so much facility. At the same time, the details of masonry work and the style of finish were obtained by photography, which, in that respect, gave it a great superiority over any sketch.

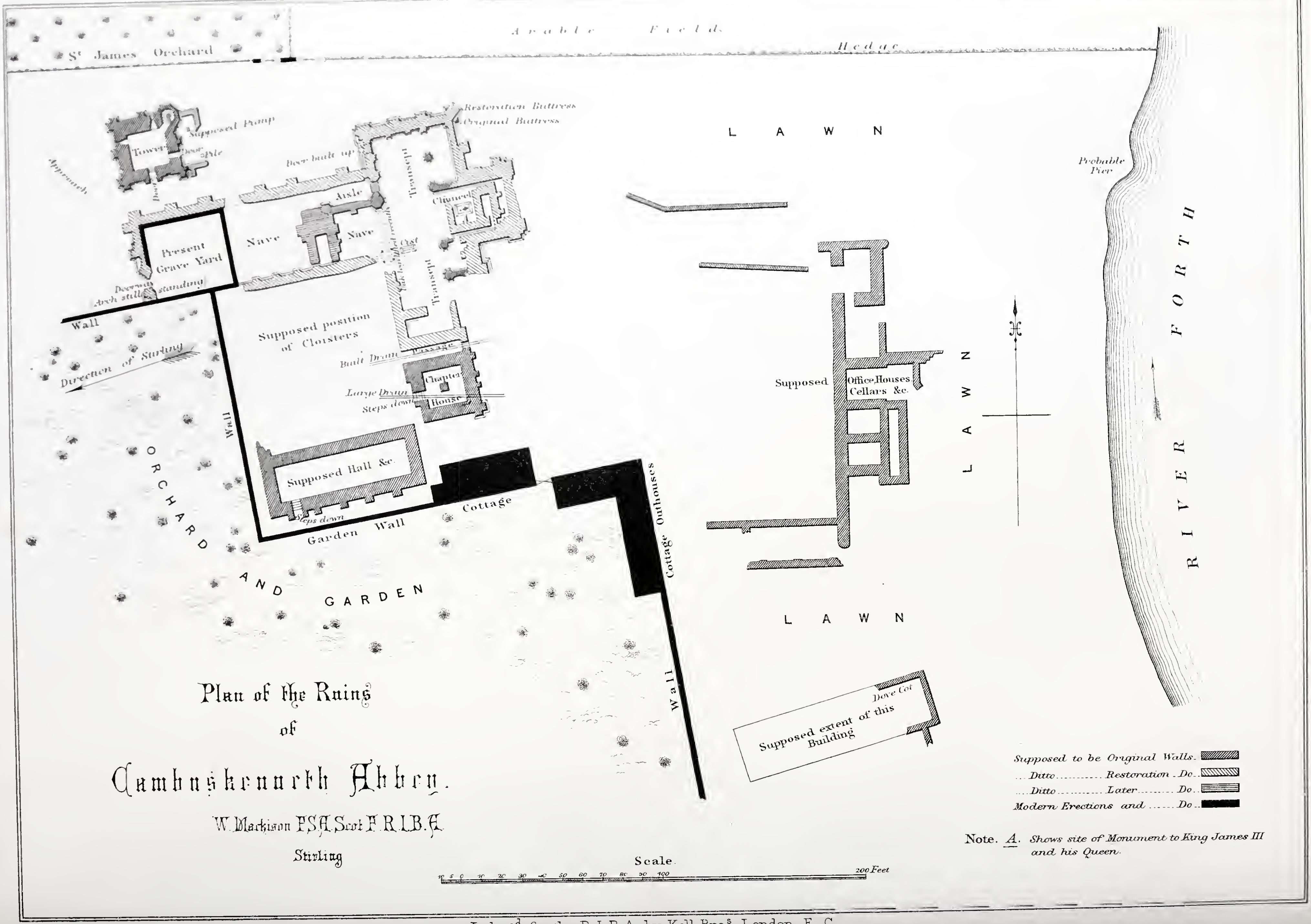
Mr. Lamb agreed that, in regard to fidelity of illustration, photographs had the advantage of a sketch; but even in the bookcases of well-ventilated libraries there was a certain amount of dampness, which had a pernicious effect upon them. If they could be kept in a thoroughly dry atmosphere, no doubt their durability would be enhanced; but a large collection could only be kept in a portfolio.

Mr. R. W. Edis, Associate, proposed a vote of thanks to Mr. Godwin for his paper, and remarked, in reference to the subject treated of this evening, he could not refrain from expressing his regret that those who were entrusted with the photographing of these subjects, should have gone to places and left out that which was to architects, studying in the present day, much more valuable than the subjects presented. For instance, the operator who was sent to take the photographs of Notre Dame at Poitiers has been instructed to take views of the cathedral, as well as of the churches of St. Radegonde and St. Hilaire which all presented many points worthy of study. Then again, the artist who went to Civray might have been commissioned to photograph the charming details of Angoulême Cathedral. To the architect who sketched there were more valuable things than the general views of some of the subjects before them this evening; and with regard to Lisieux Cathedral, if they went into the south transept, they would have found some better subjects than those now produced. He mentioned this merely as a suggestion to those entrusted with the photography of such views.

MR. W. WHITE, Fellow, had great pleasure in seconding the vote of thanks to Mr. Godwin, and in so doing he would say, as far as he was personally concerned, he had never felt tempted to allow the facility with which photographs could be obtained to lead to a neglect of the sketch book. He thought so far from photographs being detrimental to the objects they had at heart, they were of the greatest use, inasmuch as with the most careful sketch it was impossible to get the general effect of the original object. He thought that photographs, combined with sketching, were most useful, not only for proving the accuracy of sketches, but because they recalled so many grand features of architectural beauty. It, however, seemed to him desirable that something more systematic should be adopted in the selection of subjects. The subjects before them were not only scattered about in different countries, and embraced different styles, but there was an entire absence of anything like classification. What he wished to see was four or five—or perhaps three would be sufficient—representations of the same subject under different aspects; as, for instance, one taken as a small photograph, giving a general idea of the building; then a second view taken at half the distance which would show the parts more in detail; and then some full-sized details of what was contained in the general representation. One building thus illustrated would be better than a collection of isolated works. With regard to the question of the fading of the photographs, he had always understood that they would fade unless they were thoroughly washed after toning. Whether that would entirely prevent them from fading he did not know, but he was given to understand that by what was called the carbon process imperishable photographs could be produced. We would add one criticism to what had already been observed with regard to the front of Civray. It was objected that the smaller arch in the centre had been treated simply as a portion of the façade. It would, however, be a mistake, he thought, to treat that portion, as a portal, broader and larger than the wings. It was the same at Peterborough, but Peterborough had not the advantage which Civray had, of being simply a portal. At Peterborough the centre arch was but the smaller one of three forming a façade.

The CHAIRMAN remarked, with regard to the durability of photographs, that much depended on the mode in which the paper was prepared. Having both English and foreign photographs, he had found, from his own experience, that the foreign specimens faded more quickly than the English, which were, in fact, very little faded indeed, and he attributed it to the different modes of preparing the paper, inasmuch as both descriptions of photographs were kept in the same portfolio. With regard to the observations which had been made upon the selection of subjects by the Photographic Association he could state, as a member of the council, they had had many difficulties to contend with, which prevented them from carrying out their original intentions, and hitherto they had been dependent in a certain degree upon others in the selection of the subjects. If they had an increase in the number of subscribers, which he hoped would be the result of this publicity, they would be in a better position to ask the subscribers to communicate to them subjects of interest which came under their notice, with the view of securing the representation of such subjects in a future series. He hoped next year they should be able to present the subscribers with a more interesting and diversified collection of photographs. He was glad, however, to note that in the present series there were other than cathedral subjects, as he felt there were many examples of domestic architecture which the Association had not yet attempted to illustrate by photography.

A vote of thanks was then passed to Mr. Godwin.

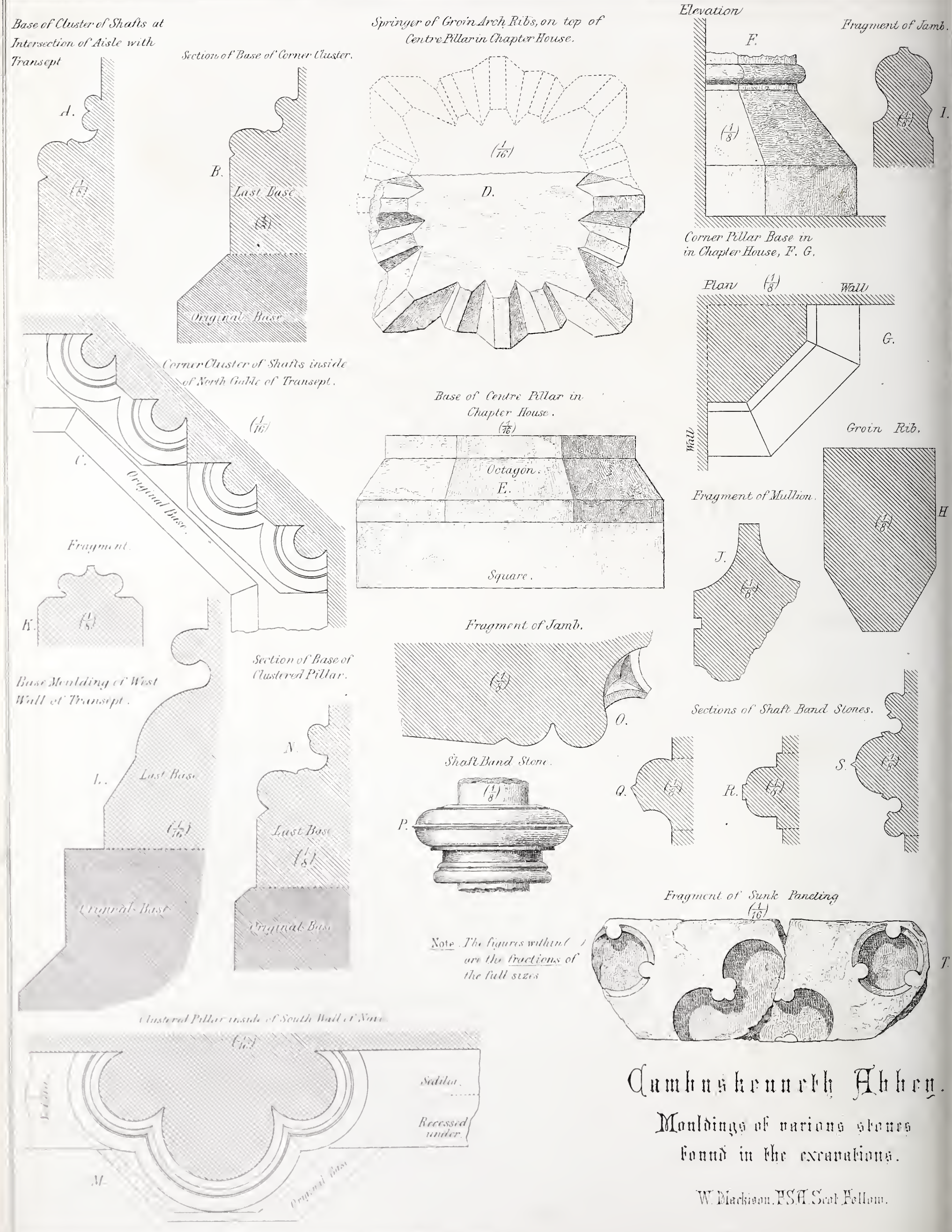


Plan of the Ruins of Cambuskenneth Abbey.

W. Mackison F.S.A. Scot F.R.I.B.A.
Stirling

Note. A. Shows site of Monument to King James III and his Queen.

Lithogd. for the R.I.B.A. by Kell Bros London. E. C.


Base of Cluster of Shafts at Intersection of Aisle with Transept
A.
(1/8)
Section of Base of Corner Cluster.
B.
Last Base
(1/8)
Original Base
Springer of Groin Arch Ribs, on top of Centre Pillar in Chapter House.
(1/16)
D.
Elevation
F.
(1/8)
Fragment of Jamb.
(1/8)
I.
Corner Pillar Base in in Chapter House, F. G.
Plan (1/8)
Wall
G.
Wall
Corner Cluster of Shafts inside of North Gable of Transept.
(1/16)
C.
Original Base
Base of Centre Pillar in Chapter House.
(1/16)
Octagon.
E.
Square.
Groin Rib.
(1/8)
H
Fragment of Mullion.
J.
(1/8)
Fragment.
K.
(1/8)
Fragment of Jamb.
(1/8)
O.
Base Moulding of West Wall of Transept.
Section of Base of Clustered Pillar.
N.
L.
Last Base
(1/16)
Last Base
(1/8)
Original Base
Original Base
Shaft Band Stone.
(1/8)
P.
Sections of Shaft Band Stones.
Q.
(1/8)
R.
(1/8)
S.
(1/8)
Fragment of Sunk Paneling
(1/16)
T.
Clustered Pillar inside of South Wall of Nave.
(1/16)
Sedilia.
Recessed under.
M.
Original Base

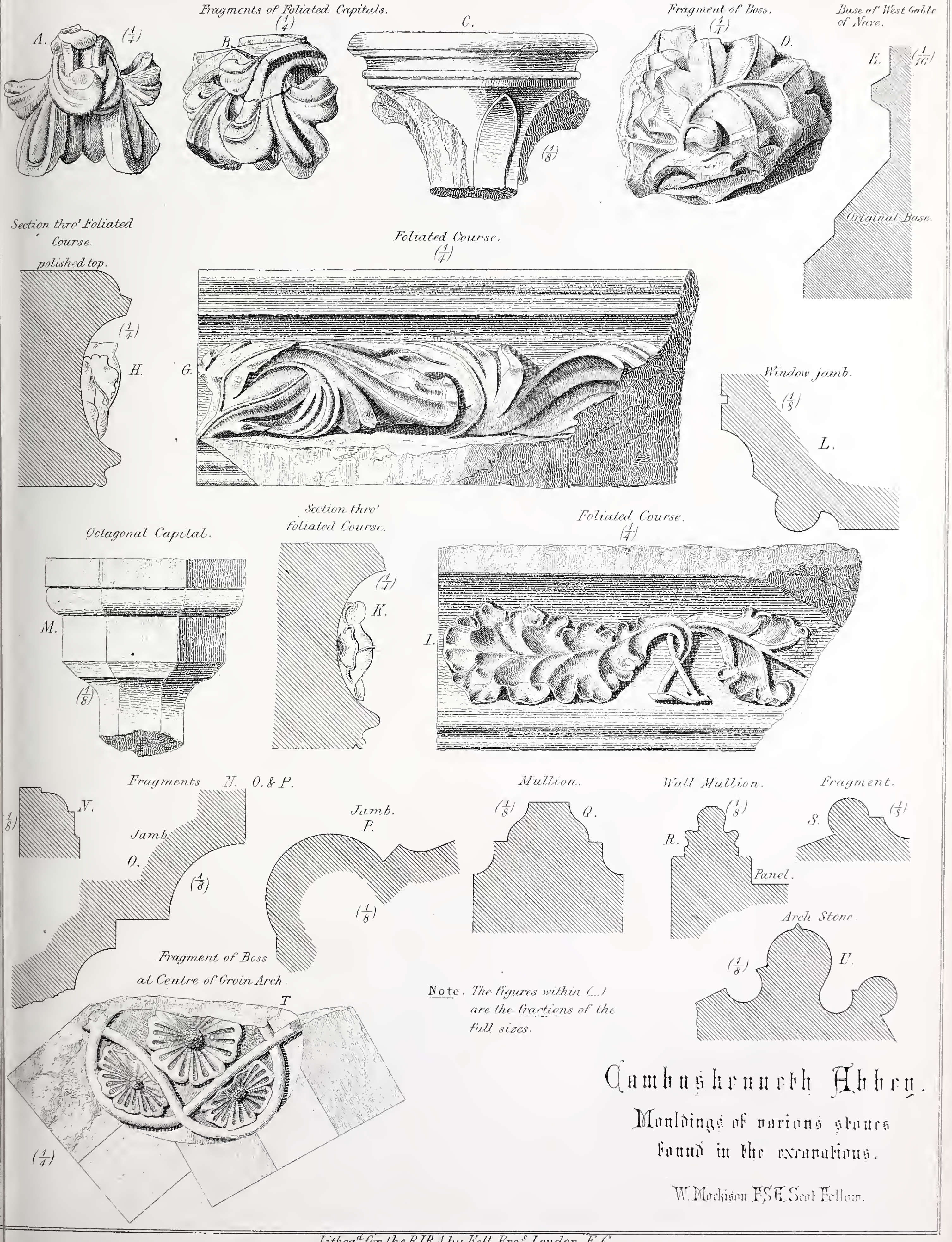
Note. The figures within ( ) are the fractions of the full sizes

Cambuskenneth Abbey.

Mouldings of various stones found in the excavations.

W. Mackison. F.S.A. Scot. Fellow.

Lithog^d for the R.I.B.A. by Kell Bros London E.C.



Note. *The figures within (...) are the fractions of the full sizes.*

Cambuskenneth Abbey.

Mouldings of various stones found in the excavations.

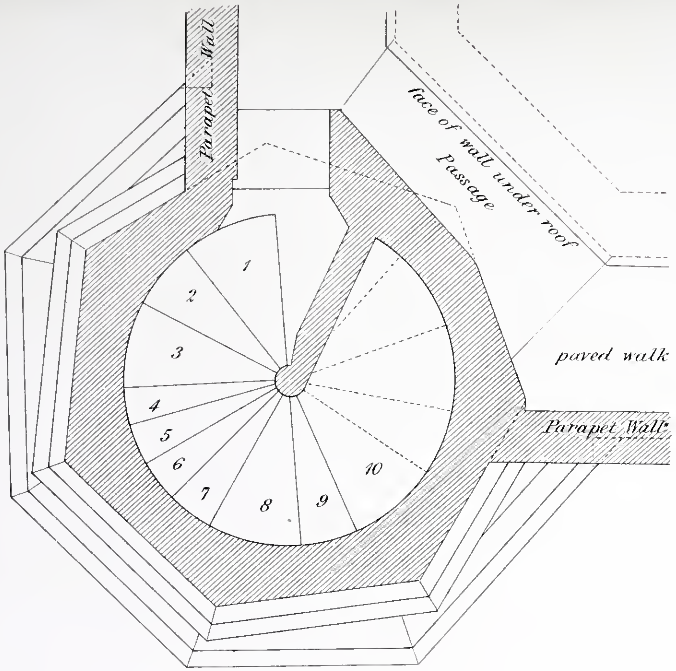
W. Mockison F.S.A. Scot Fellow.

Lithogd. for the R.I.B.A. by Kell Bros. London, E.C.

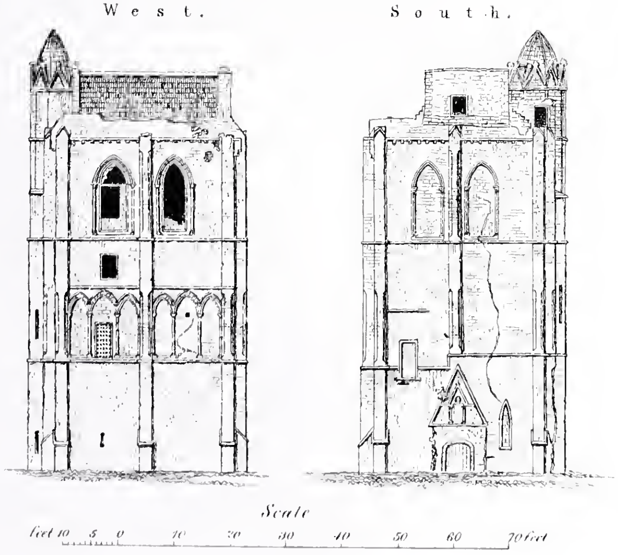
Cambuskenneth Abbey.

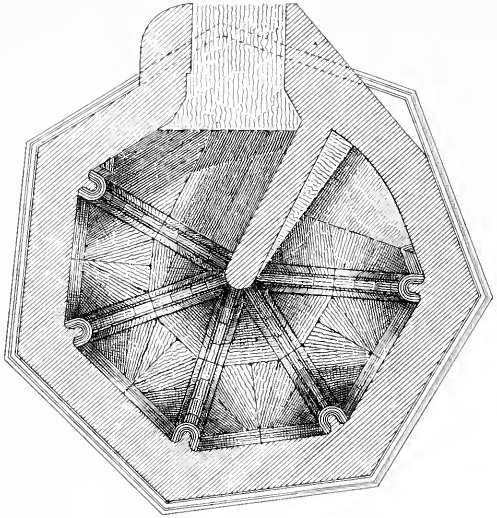
Drawings in Connection with Tower before Restoration,
and of Stones found in the Ruins.

Plan of Turret Stair
(¼ inch = 1 Foot.)

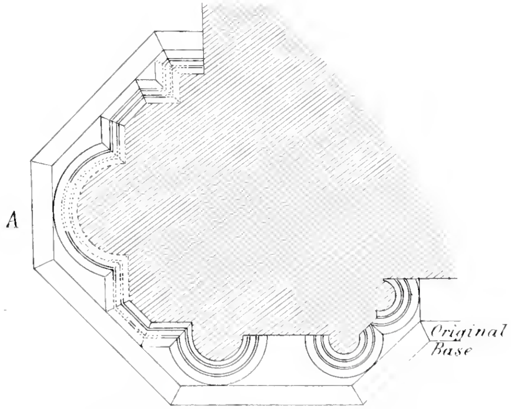


Elevations of Tower before Restoration.



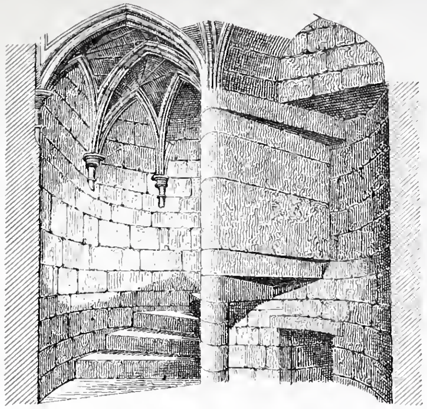


Plan of Groining at Top of
Turret Stair.
(¼ inch = Foot.)

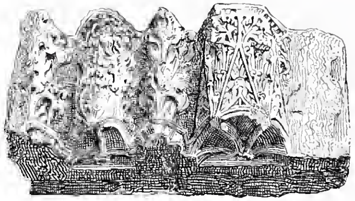


Section of Cluster Pillar at Intersection
of Aisle with Transept.
(1/32 full size.)

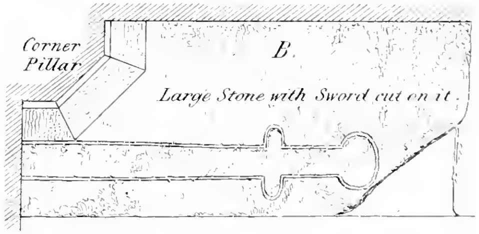
View of Top of Turret Stair
shewing Groining.



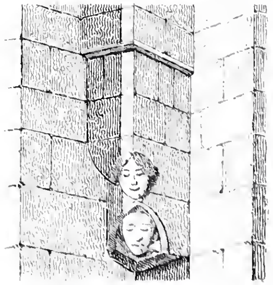
Canopy of Mural Panelings.
(1/6 full size)



South East Corner of Chapter House.


Corner Pillar
B.
Large Stone with Sword cut on it.

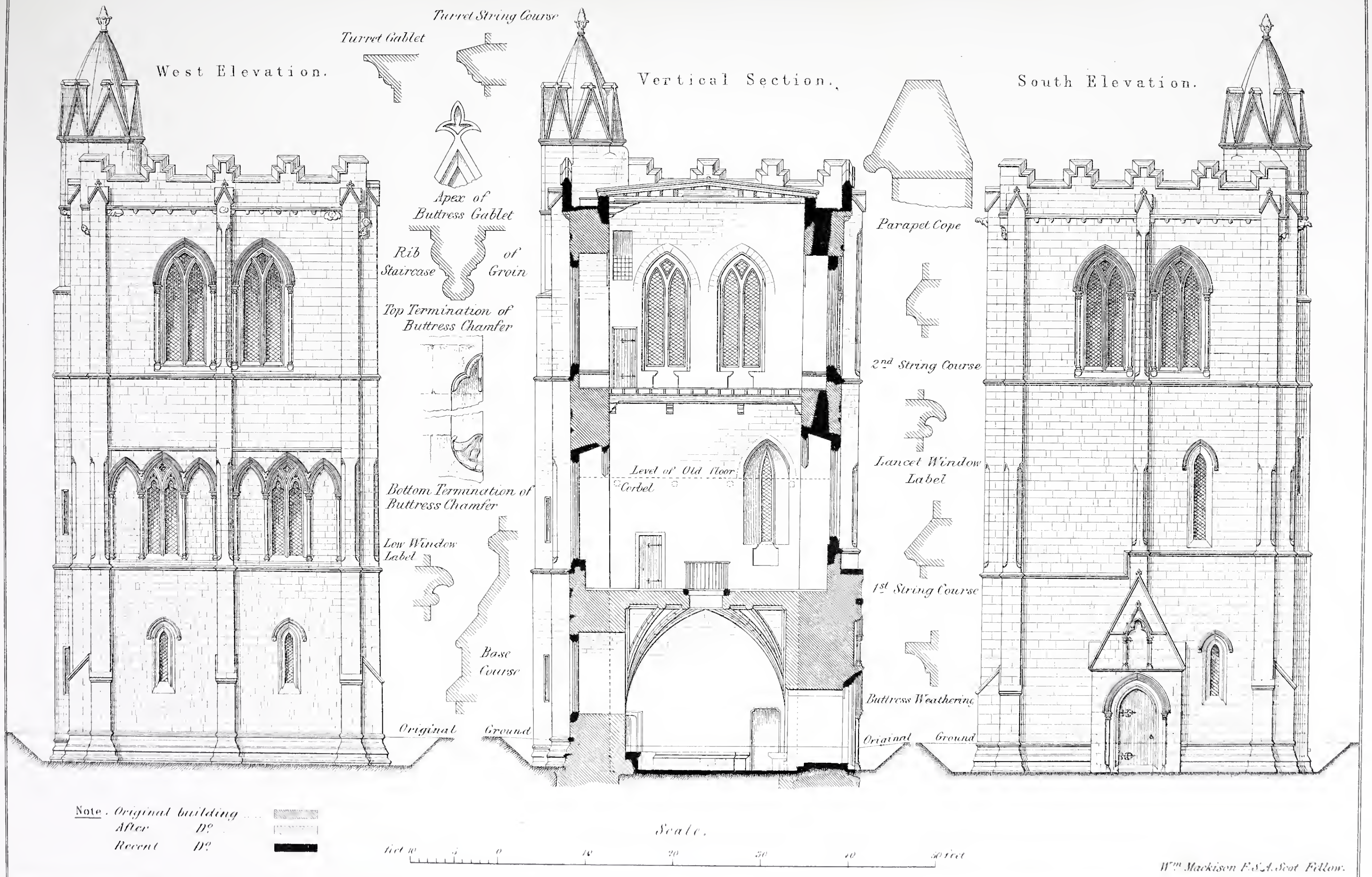
Corbel under Angle of Tower Parapet.



Wm. Mackison. F.S.A.Scot. Fellow.

Cambuskenneth Abbey Tower.

RESTORED



Wm. Mackison F.S.A. Scot Fellow.

Lithod. for the R.I.B.A. by Kell Bros. London E.C.

NOTES ON THE RECENT EXCAVATIONS MADE AT CAMBUSKENNETH ABBEY, AND ON THE SUBSEQUENT RESTORATION OF THE ABBEY TOWER.

By William Mackison, F.S.A. Scot: Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, February 25, 1867.

In submitting my first Paper to this meeting of the Institute, I feel that the utmost indulgence of the members will be required. Its preparation, together with that of the drawings by which it is illustrated, has been to me a very trying task indeed; not so much, however, on account of the time and labour expended on it, but because I wished to make it worthy the attention of the distinguished body of professional men before whom it was to be read.

The ruins of the old Abbey of Cambuskenneth, as revealed by the excavations recently made, furnish us with a partial outline of that once famous monastery, and with some materials indicative of the style of its architecture, the features of its construction, and the extent of its range. Excepting, however, the tower and a portion of the west main door archway, which still stand, little indeed remains but very dilapidated and fast-decaying portions of the exposed walls and foundations. It will therefore be necessary to gather as much from history as we can, in order to form as full an idea as possible of the character, importance, and magnitude of this once noble edifice; and I trust that this historical sketch, accompanied with a topographical description of its site, will not be without interest, before I enter upon the consideration of the ruins, and restoration of the tower.

The name Camus-Kenneth signifies the "field or creek of Kenneth." There is a strong supposition that this "field or creek," or *peninsula*, formed by the beautiful windings of the River Forth, on which the Abbey stood, was the rendezvous of the army of Kenneth II. when he was avenging the death of his father, King Alpine; formerly taken prisoner by the Picts, and cruelly murdered by them. The battle is understood to have been fought in the fields around the *site* of the old Abbey, which is situated on the north side of the Forth. The Picts were at that time in possession of the castle and town of Stirling, lying on the south side of the river, and about a mile to the south-west of the site of the Abbey. At all events, some transaction of one of the Scottish kings, of the name of Kenneth, in the immediate neighbourhood of the site of the Abbey, is most likely to have given the name "Camus-Kenneth," more properly "Camus-Kynneth," and as now written, "Cambuskenneth."

Notwithstanding the close proximity of the Abbey to Stirling, it was not in Stirlingshire; it stood in the shire of Clackmannan. Its position was one of extreme beauty, in relation to the surrounding scenery. To its south-west rises the town of Stirling, on a rocky slope, till it merges into the grey walls and battlements of the time-honoured and weather-beaten old castle, towering in fine relief some 400 feet above the plain, on which it was built. To its west stretches out the long flat vale of Menteith, with the picturesque Craig-Forth, and beyond, the stately range of the Grampian mountains, showing conspicuously the lofty summits of Ben-Lommond and Ben-Ledi. To its north-west and north are the valley of the Teith, the wooded slopes of Keir, the crags of Airthrey, the verdant Ochil hills, and the much-admired "Abbey-Craig," so named, no doubt, from its connection with, and its proximity to the ancient Abbey. And to its east the beautiful windings of the Forth, issuing, as it were, from the rocky, rugged base of the precipitous Abbey-Craig, and sweeping with a graceful bend round the lands of Cambuskenneth, it thence flows down through the fertile carse of Stirling in serpentine beauty, where, it is said, " A loop of the Forth is worth an Earldom in the north." So tortuous, indeed, is the course of this river, that after having run a mile or two it again returns, by curving back to about 100 yards from its previous channel, and by the time it has reached the quay of Alloa—a little over five miles off, " as the crow flies"—it has traversed nearly eleven miles.

From the top of the Abbey-Craig, which is about 360 feet high, and not over a mile distant from the ruins of the Abbey, there is a commanding and impressive view of the old Abbey Tower, Stirling town and castle, and the rich surrounding country, so often the arena of bloody conflicts, and important national transactions in the past history of Scotland. And when, with a full tide up, or swollen by a Highland flood, the river Forth is beheld from the castle ramparts, under the rays of a bright summer sun, the sight is one full of pleasure and grandeur, and not likely to be soon forgotten. From the Abbey-Craig and Abbey-Tower it is also fine, but from the castle especially sweet. From it the old Abbey-Belfry-Tower, shows its massive square head and turret over the orchard trees in dignified seclusion, and is surrounded in its quiet nook by the river as by a band or brilliant banner of liquid fire, unfurled through the fertile fields, and losing itself in the distant Frith of Forth. The site selected for this monastery, whilst it was one of great beauty, was no less one of great convenience. The country was rich and fertile around it: grain of every kind, ample varieties of provisions, and sufficient fuel could be got for the community; whilst the river yielded abundant reward to the careful fisher, and afforded ready means of obtaining materials for building purposes, many of which materials, during the erection of the Abbey, must have come from considerable distances.

This once imposing edifice, the Abbey of Cambuskenneth, was founded by David I. in 1147. He was a monarch whose pious inclinations lay much in this way—historians say *too much*—for " he greatly impoverished the revenues of the Crown," by his putting in repair such religious houses as were decayed or injured during war, and by erecting new buildings of a similar kind, and richly endowing them. No less than *eleven* abbeys had been founded and endowed by this king, besides many other religious fabricks. He was rewarded by an admiring and deeply-interested clergy, for his *extreme* piety and beneficence, by their conferring on him the title of " St. David." This Abbey had during its early history considerable possessions, whatever its assumed poverty may have been—an assumption which, from the earlier part of the thirteenth and for the two succeeding centuries, disposed many persons of a pious and liberal disposition to contribute towards its support; to which I shall yet take occasion to refer. It is presumed, that its nearness to Stirling castle may have exposed it to frequent invasions, and consequent impoverishings; by lawless plunderers, and internal feuds. No sooner was the Abbey ready to receive inmates, than a staff of monks of the Order of St. Augustine, or Canons Regular, were brought over from Aroise, near Arras, in the province of Artoise, in France. It was dedicated to the Virgin Mary; after a time it came to be styled " The Monastery of Stirling." There is an idea given out by some, that this Abbey was originally intended to have been erected at Stirling; or that Stirling and Cambuskenneth may have been used synonymously. In the Chartulary* it is designated " Abbey of Stirling," prior to 1159, by Robert, Prior of St. Andrew's; " St. Mary of Cambuskenneth," by Simon, son of Macbeath, about 1168; and " St. Mary of Stirling," by Papal Bulls of 1147, 1164, and 1195. These Bulls were protective and confirmative; the first in 1147, by Pope Eugene, " dilectis filiis Willielmo Abbati ecclesie Sancte Marie de Striveling ejusque fratribus." The one in 1195, directed by Pope Celestine III., was remarkable in this, that it detailed the " possessions, tithes, and immunities" of the monastery at that time, " under pain of excommunication," as well as the " official powers and privileges" of the abbots, bishops, monks, and priests, as regarded both their "spiritual functions and temporalities." It further authorized "the performing of Divine service with a low voice, and shut doors, without ringing bells, lest they incur a national interdict." These Papal bulls specify as abbots of the Church of St. Mary of Stirling "William, Alfred, and Nicholas." In 1201 Pope Innocent III. granted a bull, making secure what had been given to the monastery since the issue of the previous one. To this day the main street of Stirling, which leads from the High (Broad) Street to St. Mary Abbey, is still named "St. Mary's Wynd." In it there are still some very old and noted buildings standing, the most of which are presently inhabited.

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* 'Brief Analysis of the Chartularies of the Abbey of Cambus-Kenneth,' &c., by John Graham Dalyell, Esq., 1828. The original documents being now deposited in the Advocates' Library, Edinburgh.

It may not be without interest to bring under your notice the charter granted by David I., as given in the 'History of Stirlingshire.'* Although no date is attached to it, yet there are collateral circumstances which indicate, that it must have been granted earlier than 1152. Several sovereigns in succession confirmed it. It runs as follows:—

"PRIMA CHARTA ORIGINALIS DAVID REGIS, FUNDATORIS NOSTRI DE CAMBUSKENNETH.

"In nomine Patris, et Filii, et Spiritus Sancti, amen. Ego David, Dei gratiâ, Rex Scotorum, assensu Henrici filii mei, et Episcoporum regni mei, Comitumque et Baronum, confirmatione et testimonio, concedo ecclesie Sancte Marie de Striveling, et canonicis in ea regulariter viventibus, ea que subscripta sunt, et pace perpetua confirmo. Hec itaque sunt, que prefate ecclesie concedo. Terram de Cambuskenneth, et piscaturam inter eandem terram et Pollemase, et unum rete in aqua; terram quoque de Colling, cum nemore et suis rectis divisis; terram etiam de Dunbodenum, que est inter aquam ejusdem terre et terram de Loching; quadraginta quoque solidos, de redditu meo de Striveling, et canum unius navis, et unam salinam, et totidem terre quot habet una de salinis meis, et decimam firme de dominiis meis de Striveling, et oblationes que in predicta ecclesie oblate fuerint; et insulam que est inter Pollemase et Dunbodenum, et viginti cudernos de caseis redditus mei de Striveling; eandem quoque libertatem et consuetudinem, quam ceteris ecclesiis terre mee concessi et confirmavi, eidem ecclesie concedo et confirmo. Volo itaque, ut quecunque predicta ecclesia in presenti possedit, vel in futuro possessura est, ita quiete et libere, sicut ego prefatas terras possideo, possideat. Salva defensione regni et justicia regali, si Prelatus, aliquo impulsu, a justitia exorbitanaverit. Hugus confirmationis testes sunt Henricus filius Regis, Robertus Episcopus Sancte Andree, Gregorius Episcopus Dunkeleden, Herbertus Electus de Glasgow, G. Abbas Dumfermline, Abbas Sancte Andree, Robertus Prior Sancte Andree, Gilbertus Prior Jeddewart, Edwardus Cancellarius, Comes Duncanus, Leodolphus de Brechin, Hugo de Morville, Herbertus Camerarius, Will. de Summerville, Alanas de Foulis, William de Lindeff, Walterus de Ridale."

If the Abbey was not in an affluent condition, the fault could not be laid at the door of David I., whose reign has been described as "the grand period of the mortar tub" for Popery in Scotland. From the cathedral down to the humblest village church, religious buildings were raised under his royal patronage and zeal, and shared of his liberality. The gifts so profusely bestowed by him for ecclesiastical purposes, affected very seriously the coffers of his successors, one of whom,

"King James the First, roy of this regioun,
Said that he was ane sair sanct to the Croun."

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* By Rev. Wm. Nimmo, second edition by Rev. Wm. Macgregor, Stirling, 1817.

Many were the donations given by David I. in addition to what was granted by his charter. One of the most curious of these was, "the half of the skins and tallow of all the beasts slain for the king's use at Stirling." But such acts of beneficence were not confined to him. This Abbey received many valuable oblations from other kings, and from earls, and nobles, and bishops, and barons, and in fine from every rank of the people, and to such an extent, that the wealth of the Abbey must have rapidly increased during the first two hundred years of its history; by which time its possessions were to be found in very many and in very distant parts of Scotland. These gifts and oblations consisted of lands, mills, tofts, fishings, tithes, salt pans, chapels, churches, church lands, pasturages, cattle, hospitals, customs, &c. To give a fuller idea of the extent and wide-spread character of these, I will instance a few of them in detail. About the middle of the twelfth century Robert, Bishop of St. Andrew, granted to the Abbey "the church of Eggles (St. Ninian's), with its chapels of Dunipace and Lethbert, and all its other chapels and oratories, and all other pertinents." By King William, "a full toft in the village of Perth," the church of "Kinclething," "Tullicultrie," "Kincardine," "Gleninglefe," with "lands" and "other pertinents." By Countess Ada, "one full toft in the burgh of Crail," "one merk of silver out of her revenue of Crail," "common pasturage in Petheorthing." By Allan, grandson of the Lord High Steward of Scotland, "a full toft in the burgh of Renfrew, and one fishing in the water of the same village," "carrucates and half carrucates of land," "the pasturage of five hundred sheep and twenty cows," "two gangs of oxen," "fifty shillings out of the Custom of Perth," "an hospital, dedicated to St. James, which stood at the end of Stirling Bridge," "annuity of ten pounds of silver from the lands of Plane," "the mill of Clackmannan," "fifty acres of land;" and such like, are mentioned as the grants of various donors. The revenues may, generally speaking, be said to have been derived from every source yielding profit, with, and often without, the contributor's will.

With reference to the alleged poverty of the Abbey during the earlier part of the thirteenth century, we find that "Hugo, Bishop of Dunkeld, gave the church of Alva to the monks of Cambuskenneth on account of their *poverty*," and also that "Osbert, Bishop of Dunblane, assigned the same reason for some donations" made "1230-1233;" and about the middle of the fourteenth century, the Abbey seems to have suffered greatly at the hands of "malicious persons, and hostile incursions." The half of Scotland, by the middle of the fifteenth century, was possessed by ecclesiastics; and so cathedrals and monasteries were viewed and ranked as public burdens. It was not, then, to be wondered at, that liberality to such establishments should decline. In the sixteenth century many prosecutions were made by the community of Cambuskenneth, to enforce the payment of arrears and of purposely-withheld tithes.

During the twelfth century the castle of Stirling was the residence of the Scottish kings, and courts were held there by King David I. This monarch regarded Cambuskenneth Abbey with the most profound affection, and being its founder, he may have thus desired to have his residence near to it. This royal residence was for many years a favourite one with the kings of Scotland; and there is still much about it of architectural interest, and numerous indications of its original magnificence. The close proximity of royalty made the monastery a place of great attraction and splendour. And it is recorded, that during the fifteenth century the abbots were often employed in work of national importance, and were preferred to high civil appointments. And we consequently find that much business of a civil kind was transacted at this Abbey. The abbot had his country house at "Throsk, in the border of Collie near Cowie," several miles distant from the Abbey.

Edward I. was at Cambuskenneth in 1303-4. In 1308 there was a conclave of barons held there, in order to confederate for the defence of the country's liberty, and to support the title of Robert Bruce to the Crown, and to this "they swore upon the great altar." Many charters were granted at Cambuskenneth by different monarchs. Parliaments were also held occasionally there. In 1326 a convention of the whole clergy, earls, barons, and many of inferior positions, was held within the Abbey, in presence of Robert Bruce, to swear fealty to David his son, as the heir apparent to the Crown; and to Robert Stewart, his grandson, next heir, should David die without issue. On this occasion the marriage of the king's sister was also solemnized. This is said to have been the first Scottish Parliament in which burgesses are noticed as having a seat.

The wars with England, in the reign of David Bruce, brought loss to the monastery; for during these times "it was pillaged of the whole of its most valuable furniture, and the books and vestments, and its altar cups and ornaments were likewise carried away." With the view of making up this "great loss" on the Abbey, all but "irreparably suffered" by "certain diabolical persons" not named, the "Bishop of St. Andrews, William Delandel, granted in 1350 the vicarage of Clackmannan to the community of Cambuskenneth." Shortly after this there arose a controversy between the monks and a number of the burgesses of Stirling. In 1366 the latter were compelled, by royal precept, to repair the fishing cruives in the river Forth, which they had previously demolished. The Abbey, in a confirmatory grant of the church of Kinnoul, dated 1361, is said "to have been depressed by wars and hostile incursions, plundered of its chalices, books, ornaments of the altar, and other property; that the belfry had been struck with lightning, and was disfigured by ruins, so that without speedy aid the edifice would go to destruction, the duties of hospitality would fail, and those residing there for the divine service should be obliged to beg." It further appears from the chartulary that on account of the continued "indigence" of the abbot, "the cloister and belfry" could not even be repaired by him in 1403.

In 1383 Richard II. invaded Scotland with a large army, and several towns and churches were given to the flames. Stirling, with its Abbey, formed no exception at this time to the destructive ravages of the raging war, but were consigned to the same fiery ordeal. That the Abbey suffered severely from the flames and demolition on this occasion is very evident from what of its ruins are still to be seen, in so far as they evidence the two distinct periods of building and configuration; but of this I will take more particular notice in my subsequent observations on the ruins, as now exposed by the late excavations.

The abbot of Cambuskenneth was in 1423 sent to England to negociate for the liberation of James I. from captivity, and he most successfully accomplished his high mission. We are informed that in 1445, "an abbot, a prior, and seventeen others" constituted the "establishment." The Abbey establishment would most probably be of a fluctuating nature, on account of special times requiring special numbers; and alternating times of prosperity and adversity commanding corresponding representations. This company of ecclesiastics casts a glimpse of light on what must have been the *dimensions* of the edifice. And those members of this Institute versed in conventual arrangements, will no doubt be able to form a pretty distinct notion of the buildings necessary for such a staff under such circumstances. We are, however, further informed that the "revenues pertaining to the different altars" were at this time considered, and "an arrangement" entered into and "subscribed" by the above establishment, appropriations of them were made and dedicated to "St. Andrew, St. John the Evangelist and Baptist, St. Lawrence the Martyr, St. Katherine the virgin Martyr, and to All Saints." There were various gardens which yielded support to the revenues, and which were assigned to these altars. One of them was named "Paradise," and probably the proximity of the present orchards and gardens to the site of the Abbey, and which so much enhance the spot, may be the remnants of those just referred to. One of them goes by the name of "St. James's orchard" at the present day, and this is not a name of yesterday's standing. Within this orchard may be seen a picturesque ruin, of what probably was the north boundary wall; and traces of the old foundation are also met with in an easterly direction. The line of this wall if produced westwards, would run into the river at a point near to the present ferry-boat pier, and one of the village houses has its back wall built on and partly formed of a portion of the ruin of this wall.

Several persons of high rank were buried within the Abbey. In 1488 the mortal remains of King James III., who fell at the battle of Sauchie by the hand of an assassin, were laid in the Abbey by the side of his queen, the Princess Margaret of Denmark, who had predeceased him, and was buried there. In 1496 King James IV. offered a donation "in honour of God the Omnipotent, and his most glorious mother the Virgin Mary; also for salvation of his own most noble father James III. and Margaret his spouse of happy memory, whom might God favour, and whose bodies rested there." A payment is recorded as being made to the priest "that singis for the King and Queen in Cambuskynnell," in January, 1488-9. This item is to be found in the accounts connected with the king's burial.

We are informed in history that in 1493 Abbot Henry was elevated to be High Treasurer of Scotland. In 1521 "James Bishop of Dunkeld, at the Abbot's request, dedicated the church and monastery, the two cemeteries at the east and west, and he consecrated the great altar." There is also a reference to the previous year, where it is mentioned that, in the "*Abbot's new hall*, Helen Murray, Lady of Easter Polmaise, promised to abstain from interfering with the fishery in the Forth." It is thought that the restoration of the Abbey and its embellishments must have been done during the latter part of the fifteenth century, and perhaps mainly by Alexander Mylu, who succeeded Abbot Patrick Panther, who died in 1519, as "Chargé des Affaires at the French Court." Mylu was formerly a canon of Dunkeld, and in 1532 he was appointed the first president of the Court of Session, erected at that time by James V., and this "on account of his great knowledge of the civil and canon laws."* He held this office in addition to his abbotship. One thing, however, is pretty evident, and it is this, that between 1403 and 1521 a great part of the restoration must have been effected; for from the demolition up till 1403 we have *poverty* held forth as preventing necessary improvements and repairs, whilst in 1521 we have a *formal ceremonial consecration* of the new church, monastery, cemeteries and great altar. In 1445 there was a large establishment of clerical officials, and consequently at that time there must have been suitable accommodation, and so *prior* to that a considerable restoration must necessarily have been effected. This part, however, is likely to have been of an *essential* more than of an *ornamental* character. And even going farther back, the building must have been in a partial state of repair or restoration; for we learn that in 1390 "a dispute between the Abbot and William of Fentoun, the sonne, and his man Robert of Dunbarny," was submitted to six laymen arbiters who met in the church of Perth to consider the matter. I quote one item of their decision, as it has reference to the Abbey in the above connection. "Item, we find that the said Robert has sclanderit the forsaid Abbot and his Court of Kintulach, and despitiusly spokin baith before his ene, and behind his bak; quharefor we ordane and demis that the said Robert sall cum to Cambuskynneth upon our Lady-day nixt cumis, hudles, hoseles, hatles, scholes, beltles and knyfles, in the tyme of the hie mess, with ane candle of twa pund wax in his hand; and thare, before the pepill, offer it till our Lady; and evin upon his knees sall ask the said Abbot and the convent of the place forgevenes of that trespas foirsaid."

It is recorded that fifty persons of rank, and many others, were drowned in 1529, when returning to Stirling from one of the solemnities. These sacred transactions gave opportunities for mercantile dealings, because refreshments were indispensable upon these holy days. And this requisite gradually introduced a regular trafficking, and hence we have the "*feria*," which once signified "festival," coming in the course of time to mean "fair." Many old-established *fairs* were named after the Saint in the vicinity of whose festival they were held.

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* In 1513 Abbot Mylu wrote the lives of the Bishops of Dunkeld, with some curious detail of the expense of erecting a bridge over the Tay at Dunkeld.

By a Royal command, granted on the representation of Abbot Alexander Mylu, the "legal documents" of the Abbey, which were getting into a "decayed state," on account of "the damp situation of the edifice," and the great "humidity of the atmosphere," were ordered to be transcribed; and accordingly, about 1535, they were engrossed on vellum; the folio volume extended to 174 leaves, and contained 224 different papers, all of which are properly and carefully authenticated. And to the "Brief Analysis" of these documents we are indebted for much of the information now possessed of the Abbey. The initial letters of the various documents throughout the Chartulary are illuminated.

Cambuskenneth had several distinguished abbots during the sixteenth century. The last of these, David Panther, was an accomplished scholar, and had great command of the Latin language, and he is credited with the purity of the Royal documents of that period. He was also commendator of the Abbey during the latter part of the reign of King James V., and was the last ecclesiastic who held the "lucrative abbotship," as it is sometimes termed. He died, in Stirling, in the year 1558. The monastery was along with the black and gray friars of Stirling, cast down in 1559; an eventful period in the history of monastic buildings in this country. At this time the Queen-Regent intended to garrison the Castle of Stirling with French troops, and in order to prevent his stopping the passage across the Forth, the "Lords of the Congregation," who were then met at Perth, came down and did so, by taking possession. Many other sanctified houses were demolished by the hands of the Reformers, whose zeal was so enthusiastic and irregular, as to have blinded their faculties of discriminating between the *religion* they so much hated, and the *places* in which its ceremonies were performed. Several of the monks did embrace the Reformation, and their portions were accordingly prohibited by the Queen-Regent. It is stated traditionally that one of the Abbey bells was for some time in Stirling, and that the finest of them was lost when conveying it across the Forth. And I think it very probable, that the part of the river where this must have occurred is a short distance below the present Abbey ferry—supposed to be the *original ferry*. The river is not deep at this place, and I confidently hope that the Patrons of Cowane's Hospital, with the sanction of the Forth Navigation Commissioners—if not with their assistance—will ere long, cause a careful search to be made for the "*fine old bell*," said to be at this place embedded in the river.

During the Reformation times, church benefices were not unfrequently taken possession of by those who had *might* on their side; and with no other right, or lawful possession, than "might was right." It appears from history that John, Earl of Marr, afterwards Regent, was appointed by James V. Commendator of Cambuskenneth Abbey, and of Inchmahome Priory; and that he had the disposal of the revenues. But after the Reformation, Adam Erskine, nephew of the Earl of Marr, was made Commendator of Cambuskenneth. The revenues of Cambuskenneth, as ascertained in 1562, in respect of a special order from Queen Mary and her Council, was in Scots money, £930. 13s. 4½d., and in various grains, meal, &c., 91 chalders, 15 bolls, 1 firlet, 2 pecks, and 2 lippies.

The desolation which passed over so many religious houses during the close of the sixteenth century, formed just so many quarries, from which to take stones for the erection of other buildings. There stands at the top of the Broad Street of Stirling, near to the old Gray Friars, or Franciscan Church, and not far from the Castle, a peculiar ruin known by the name of "Mar's Wark." This building was intended for the town residence of the Earl of Marr. It was never finished. The design of what remains is rich and tasteful, though rather odd. It now forms a part of the boundary of one of the most beautiful cemeteries to be seen; and it is generally believed that the stones of which it is built were taken from the ruins of Cambuskenneth. We have an historical notice of date 1571 of the Earl of Marr, who was stationed in the Castle, "marching out with a company of musketeers, and entering, by the back-way, *his new lodgings, which were then building*," a building which had been neglected by the enemy who had just "made prisoners of the Regent and ten other noblemen," and so was thus rendered serviceable as the sallying point for attack and subsequent pursuit.

In 1587 church benefices were attached to the Crown. After James VI. ascended the English throne, the temporality of Cambuskenneth, of Dryburg, and of the Priory of Inchmahome was conferred on the son of the late Regent, who acted as Commendator. This Earl settled the Barony of Cambuskenneth—on which the monastery stood—upon his brother Alexander Erskine of Alva, and it was possessed by the family line of succession till 1709; at which time it was sold. The Town Council of Stirling were the purchasers. This purchase was made by them as the Patrons of Cowane's Hospital, and in behoof of the interests of that charitable institution. Cowane's Hospital was founded by the late John Cowane for the support of twelve decayed brethren. He died in 1633, and he Bestowed 40,000 merks Scots, to be invested in land or in annual rent, for building or erecting an Hospital or Almshouse, to be called Cowane's Hospital. The decayed brethren were, although poor, either a little too proud, or too conservative to their own firesides and conventionalities to be induced to leave their homes, for the comforts so magnanimously provided for them within this Hospital, a building of considerable interest at the present day, and now usually known by the name of "The Guildhall." The money, therefore, which was to have been devoted to the support of these "decayed brethren," accumulated, and in course of time, with interest added, it swelled up to such a sum, as to enable the Patrons to make the happy investment of the Abbey lands; on which stand the remains and ruins of the old Abbey; and also of those portions of the Abbey lands adjoining Stirling. These lands have been and still continue to be feued off for building purposes, and let out on lease as farms and gardens; and the revenue now annually arising therefrom, to the funds of this charity, average somewhere about £3,500. It is not, therefore, surprising that the Patrons should have been in a position to lay out a considerable sum of money in restoring and putting in good repair the old Abbey tower, and in beautifying the adjoining grounds; and all praise is due to them as conservators of this monument of the middle ages, and for their late efforts to make this the more complete, by their causing the recent excavations to be made at the Abbey. Such actions enhance the value of their "trust possessions," and add a valuable contribution to the archæology of our country. We now come to note the manner in which the excavations were carried out at Cambuskenneth; and, what hidden evidences of the past, were in consequence brought to light.

Various parties lay claim to, or have got the credit of being the first, to suggest the desirability of having the ruins of Cambuskenneth revealed by excavation. I believe the appearance of the ground before it was thus disturbed—and I express my own feelings—naturally suggested that there should be an operation of this kind performed; and that it would not be a difficult undertaking: for no one could fail to be impressed with the fact, as he passed over the undulations of the ground, and noticed the irregularities of its surface,—which was then covered with a beautiful sward of grass,—that there were distinct traces of lines, in different directions, which were *not natural;* but which had *strong marks of design* in them. As to those who consider the honour due to them, I would say that they were all represented at the excavations, and were most anxious that this work should be gone about in a proper, constitutional, and satisfactory manner. Some ten years ago John Christie, Esq., now one of the Bailies, in Stirling, wrote an article on the desirability of making excavations at the Abbey, and stated what he thought might likely be turned up in the course of such a work; and again, several years after this, he suggested at the Council Board that the weavers, who were at that time out of employment, should be set to the work of excavation. The local journals also claim some credit: they, at all events, advocated this work, and recorded faithfully the progress of events from time to time. The Society of Scottish Antiquaries were named too in this connection: and they were, to their credit, often represented on the ground. The public contributed a small sum to aid in defraying the expenses and in starting the work, but it was by private donations that the expense was mainly borne. Provost Murrie, of Stirling, obtained the necessary permission from the Board of Works, and the Town Council of Stirling, as Patrons of Cowane's Hospital, instructed me, then acting as Master of Works, Town Architect, and Burgh Surveyor for the Town and Hospitals of Stirling, to see the excavations properly carried out; and they paid the balance of the cost out of the Hospital funds. The interest all along displayed by the Council in this work was very great; and had it been otherwise, they would have fallen far short of their past reputation of being ever-active in the promotion of whatever tended to improve their trust, adorn the town, and give comfort and pleasure to its inhabitants.

The excavations were commenced on May 3rd, 1864, in presence of various officials and interested parties. With the exception of the tower, the ruins of the western door and arch of the nave, and of those of the dove-cot, no walls whatever were exposed to view; but, as I have already stated, the rectangular furrows and ridges so boldly shown on the ground, and which were formed by the removal of stones from the old walls, and by the accumulation of *débris* on either side thereof, showed most clearly that at some time in the past large buildings had stood there. The ground was first broken near the north-west intersection of the aisle with the transept (see Plan of Ruins, plate I.), and a few spadesfull of earth removed served to convince all present, that there were still underground ruins which might tell some wonderful tale; at least, which were well worthy of being laid bare. The first stones brought to view, were those of the extreme base of the western face of the transept at this place; and the boldness of the mouldings, the excellent preservation of the hewn stones, and the sharpness of the lines, had the most exciting and encouraging effect. The workmen, twelve in number, pricked their ears, and went most enthusiastically to work, believing that, if stone would keep so well, there might very probably be something *else*, even more valuable and useful, in as good a state of preservation. The stones generally had the usual trade masons hieroglyphical-looking marks upon them; many of these were very distinct, and evidently very carefully made. From the starting point the excavations were carried on along the transept wall northward, and along the aisle wall westward; and the clearing of the external faces was the first part of the operation. The top of the walls were then cleared, and also the earth lying within the walls and adjoining them, to such a depth as would show distinctly the thickness of the walls, and their inside lines. The laying bare of the north wall of the aisle on to the break—at which place a road passes over to the cottage—exposed three buttress foundations on the outside of the wall; but these and the wall itself had very irregular outlines, and must have been the top of the foundation work; for, except at the corner of the intersection, no trace of facing stone was visible above the level of these.

Lying close to the inner face of this foundation, and about opposite to the middle buttress, were found the remains of a human skeleton, at no great distance under the surface of the ground. At the inner angle of the intersection of the aisle and transept walls, a compound respond pillar base, with a large cluster of shafts and intervening fillet members on it, was uncovered; the base mouldings of which were in some parts in pretty good preservation, but on the whole so dilapidated as to prevent my making a complete plan of them. I have, however, supplied the wants by dotted lines (see A, plate 4). The section of the shaft base, however, was accurately got, and is marked A on plate II. of the accompanying sheets of mouldings. The external base at this place is shown by section L, and this is by far the best preserved part of the remaining base course. The drip roll moulding of this base has been very much admired by professional men, and in fact the whole of it, for its decided boldness. Here it will be noticed that there are two distinct bases shown in section, and these belong to the original and restoration buildings of the Abbey.

From anything that I can see in the tower, and other fragmentary remains of the monastery, the style of the architecture appears to have been Early English. The windows, doors, mouldings, and gurgoyles indicate this; still the small projection of the original buttresses, and the form of the base F of the corner pillar G in the square building south of the transept, seem to partake of a Norman air; but, taking in connection the centre octagon pillar base E, and its groin springing stone D, and groin rib H, the transitional or Early Gothic feature is present in the same apartment. If the rise of the Early English style of architecture is confined to the end of the twelfth century, then it seems to indicate that the original building could not have been Early English; for, generally speaking, the adoption of the various Gothic styles in England, have preceded their introduction into Scotland, by nearly half a century. If, however, the tower and nave ruins already alluded to be coeval, and have so marked a correspondence in mouldings and unity of design (as they possess), the Early English must be admitted, at all events, as the style of these; whatever may have been the style of the other parts and buildings of the monastery. of which as yet I have got no information whatever. Several years would, no doubt, elapse before this edifice was completed, even so far as the first notions and design went; but it is very probable that subsequent additions may have been made to it, as occasion demanded, and circumstances permitted. But, accepting the tower, and base of the west gable base course, as parts of the original building—and I do not see any reason for not doing so—we must accept the style as Early English, in so far as we have data to judge by, although the style was then not very old. When we farther consider who the founder was, and the extreme devotion he had to the work of erecting religious houses, we may certainly expect that he would not be behind the age in the building of such an edifice as the Abbey of Cambuskenneth; which he planted with monks from France.

But, returning to the course pursued in excavating, I would next note, that between the intersection pillar and the north-west corner of the transept there is a triplet cluster of shafts, and a little farther on the jambs of what was once a small side door, but which latterly had been built up with ashlar work, flush, and dressed to correspond with both the external and internal faces of the wall. This is likely not to have formed a feature in the original design, as it is only the restoration base that is returned into it; the original base passes in an unbroken line through below it. In the corner another cluster of four shaft bases and fillets were exposed. These stones were in very good preservation, and are represented in plan by C. Each pair of shaft bases rest on a common base, and these again on the original base. This is very marked, by their not having been set off to the same angle. The apparent inattention paid to the rigidly following of the main lines of the original base seems to indicate, that it was not intended that it should come into view with the last building at all, and this will appear more evidently as I proceed. The section of these corner shaft bases is shown by B. The old bases were in quite good keeping round the outside and inside of the west side, and north gable transept walls. Little more than a course of ashlar, or regular clean-hewn coursers, from six to ten inches high, remains at a very few places over the base courses, and the inside and outside faces of the walls thus appear to have been faced with clean-hewn ashlar stones. On the outside of the transept gable there are three buttress offsettings, one of them in the centre of the gable; and on the inside two clusters of shafts and an octagon respond. Following the line of wall eastward, we come to an angle buttress, built on the ruins of the two original square buttresses at the north-east corner. The portion of the wall extending between the transept corner and this buttress has not been lined off properly, and so comes in over the splay of the old inside base in a squinting direction, and leaves the top bed of the outside one exposed in wedge-shaped fashion; thus showing again very distinctly the two periods of building.

I have often observed that the masons of the present century go very often wrong in setting off angle buttresses; and this want of true angular placing must frequently have been observed by many of the members of this Institute, especially at the top weathering stones, where the angle of the quoins rise not out of their centre, but to either side; or by the sides of the buttress coming more upon the gable or wall than upon the wall or gable, as the case may be. I am strongly inclined to believe, that in the instance before us, this angle buttress was the main cause of so great a deviation from the original lines (which otherwise look so true), and followed so closely in general by the rest of the restoration walls. In the internal angle there is a small square projection, the seat, no doubt, of another small combination of clustered shafts. As we approach the chancel, the last and old bases, are more judiciously combined; the former rises from the top of the splay of the latter, and gives the effect of oneness. The angles of the splays are, however, slightly different. There is one buttress on the outside of this wall. The inside original base turns inwards along a party wall, between the chancel and the north-east apartment, which may have been the vestry, or one of the small chapels or chantries, (as, from an item already mentioned in connection with the funeral of King James III., such chantries must have existed), on to the transept corner pillar, where its splay mitres into that of this octagon pillar, and returns on the chancel side of the wall, already mentioned, till it reaches the high altar foundation masonry. On the outside of the chancel wall at this place the two base courses are again distinctly seen, and the contour of the original buttress seems to have been followed here in the last edifice. The chancel south wall is in much the same state of preservation; and the wall in the ruins extending southwards from this, is lost trace of at the first buttress. The masonry inside of chancel connected with the altar and altar screen is nearly all of under groundwork, and consequently of irregular outline and ill defined. In excavating the open area, supposed to have been that under the high altar, it was found to be built to the depth of about six feet under the top surface, with plain faced walls, which had set on them all round a very rudely dressed cope stone. Within this area was found first the skeleton of a child, laid across the north end; and about five feet under the surface that of a man, laid in the other direction. The mould surrounding these skeletons was composed of a mixture of clay, lime, and gravelly matter, and it was observed that under the last found skeleton this compost earth was considerably stained; evidently from the absorption of decayed juices from the decomposed body. The freshness and entirety of these skeletons, and the earthy matter in which they were deposited, indicate that they must have been buried subsequently to the demolition of the Abbey, and that lime had been employed to hasten the decay, especially of the former. One of the legs of this skeleton was very much bent outward at the knee, indicating some infirmity in the man, or some defect in the stretching before interment. It is not improbable that *foul play* may have been the truest cause.

In front of the altar, and within the screen wall another area was exposed, and in the course of digging it up, which was done to considerable depth, a large slab of bluish black marble was discovered, with one corner up, and the main part of it deeply embedded. On being thoroughly cleared it was found to be all there, but one large piece had been broken off one of the angles, and was lying near it, as if done by its having been thrown over suddenly. Round the face of it was a polished margin from four to five inches broad, and the centre was picked out so as to admit of a metallic tablet plate. Several of the bat holes, into which the plate had been fixed, were quite distinct, and some of them were still filled with the lead which had secured the plate. A small bit of the tablet plate was also found; it was of brass, about an eighth of an inch thick, and had, from the workmanship on it, the appearance of belonging to the fifteenth century. This marble slab resembles very much the one in Dunfermline Cathedral, and it is considered that it was the tombstone of King James III., and that the brass alluded to was a part of the inscription plate. The stone has since given way in several places, and a small piece of it is now in this room for your inspection. The fact of this stone being in the position in which it was found, violently turned up, and yet lying all but above the supposed resting place of King

James III., taken in connection with the circumstance, that the corner piece of the tablet brass looked as if the other part had been wrenched from it, shews, I think, very clearly that this had been done in search of treasure and spoil, and that the rest of the inscription plate had been ruthlessly stolen. Beside the spot where this marble slab was found, there grew a "hawthorn bush" previously to the work of excavation. This *bush* had been always spoken of as the only thing to mark the tomb of the king.

On digging down to the depth of about six feet the remains of an oak coffin, containing a skull and some large bones were found. These were supposed to be the royal coffin and remains of King James III. The coffin was reduced to the thickness of a penny, and the close adhesion of the outside of it to the blue clay of the subsoil, in which it was laid, preserved it. The coffin was rather of full dimensions. The skull did not exceed the average size, and indicated a forehead of a pleasant form. On the left front of the altar the remains of another oak coffin and skeleton were found, but in a very imperfect and all but decayed condition. This was supposed to be the remains of the "Princess Margaret of Denmark," the Queen of King James, who had predeceased him. The bones of the King were put under my charge, and Colonel Sir James Alexander, of Westerton, very considerately presented me with a neat small box, made of oak, and bearing the inscription of "James III." cut out on the lid, that the King's remains might be put into it for more careful preservation meantime. This I accordingly did, and had it carefully sealed up and laid past. For my own part I see no reason to doubt that these remains, which I have just described, were the real remains of the royal pair, judging from historical records, traditional testimony, the tablet stone, and the prominent place in which they were found in front of the high altar. On the church side of the top of the screen foundation wall, and near to the intersection pillars, various specimens of tesselated pavement of glazed tiles were exposed; they were bedded on mortar, and adhered firmly to it, and broke in the lifting. They were of different colours, such as red, yellow or fawn, dark brown, dark green, and black. A few spare small specimens are also lying on the table before you. These tiles would be about 9 in. by 9 in. by $1\frac{1}{2}$ in.; fragments of a thinner sort were also found of a ruder make, with dark brown centre, and $1\frac{1}{4}$ in. broad sienna border, these were about $\frac{3}{4}$ in. in thickness. A stone pavement, 7 in. by 7 in., and of greater thickness than the first mentioned tiles, was got, and had a figure cut on the top of it, resembling four fleur-de-lis heads, forming a square design; the outline of the figure was very neatly formed by a shallow groove sinking. The south wall of the area last noticed has a splayed base coming in close contact with, and at the same level of the original inside base course of the chancel south wall, and forming a V channel with it; and this groove has been looked upon as the original water run in connection with the piscina, perhaps it may have taken its place in the original church.

The course of the excavation was now changed, on account of the discoveries just mentioned, and the workmen were set to trenching to a considerable depth the whole area of the church. This resulted in the laying bare of various bases of the original octagon pillars, and a stone coffin or cist in the transept on the line of the nave wall, and near to the west intersection corner. This was found at a depth of about five feet, and was cut out somewhat to the shape of the body. It contained a skull and some bones, but they shewed evidence of having been previously disturbed. The skull was found lying at the foot. The cist was covered with three large undressed stones; and most probably this was the resting place of some of the monastic dignitaries. This stone coffin rested on two black oak logs, which belonged to the foundation structure. The position of these logs is shewn on the Plan of the Ruins. They were 14 inches by 9 inches on section, and several of them about 21 feet in length. They were laid in pairs, each pair parallel; one pair stretched between the nave and transept compound respond pillars, and their use seems to have been the preventing of these pillars, (which had to support great weight,) from sliding inwards or downwards through the soft clay underneath; this pair measured 3 feet 5 inches over, thus leaving about 13 inches clear between them. The easternmost log projected westward 13 inches past the outer intersection log, and the westmost one 21 inches beyond it; this was immediately under the foundation of the south-west respond, of which there was no trace left. The other pair measured 3 feet 3 inches over, and were lying partly under the stone coffin and the south wall of the nave, but these were shorter timbers. The ruins of this wall were certainly not original, for some distance at least; for these logs were entirely surrounded by clay, and no trace of building found resting upon them. At their intersection the logs were half checked on to each other, and at the external angles of intersection there were small piles driven down; these would be from 5 to 6 feet long, and from 4 to 5 inches in diameter. The oak logs I caused to be raised sometime afterwards; they were in good preservation, as the specimen before you will shew; and the whole wood, after it was allowed to dry, was sold, and has since been manufactured into ornaments, with the exception of as much as will make two handsome Chairs for the Provost and Dean of Guild. A strange conglomeration of walls was exposed in the nave. There is a slight trace of a door entering the small area right in the centre of the nave from the east. The area had been faced with dressed masonry. The dense portion of this ruin is of solid rubble building well grouted. The whole of it is of later work, for it had been built over the splays of the bases of the nave pillars. It may not be improbable that, during the necessitous times of the establishment, the church had been divided here into two, or that this may have been one of the altars referred to in the historical notices of the Abbey. Its level, however, when taken in connection with the south nave wall clustered pillars, indicates a subsequent erection. The continuation of this ruin shows the aisle cut off from the transept and east part of the nave, and attached, as it were, as an adjunct to the western portion of the nave.

Near to the intersection pillar, at which I commenced this sketch, was exposed a small part of the floor, which had been laid with small flags of pavement, but not in good preservation, and on going a little deeper, the hard under-surface of the original floor was reached. The difference between these levels was from six to eight inches, and the upper was at such a level as just to conceal entirely the original base. The remains of human bones were also found at this part of the interior of the church. It is most likely that some of the small altars were placed there. By the excavations, and this work of trenching, a large quantity of fragments of shafted columns, from four to six inches in diameter, were turned out, also band stones, of which P, Q, R, and S (plate II.) are representations; fragments of mullions, jambs, archivolt, and other moulded stones, shown by K, J, I, and O (plate II.), and L, N, O, P, S, and U (plate III.); and fragments of sunk paneled stone by T (plate II.), and fragments of plain and foliated capitals and groin bosses, beautifully executed, represented by M, A, B, C, D, and T (plate III.) The foliation in the capital appears to have been of upright formation. Various pieces of earthenware vessels were also found, but their appearance presented nothing very striking and worthy of notice. Small specimens of the lead quarries with which the windows had been glazed were picked up; they had very narrow margins, and exceedingly small lozenge-shaped panes, not much over an inch in length, and glazed with dense coloured glass, which would certainly only admit a very meagre supply of light. A small piece of polished marble, which resembled the top of a font, was likewise found. Occasionally fragments of stone and wood were exposed which had been subjected to the influence of fire, thus adding additional testimony to the historical account of the destruction of the Abbey.

The south wall lying outside of the present graveyard, which occupies the western end of the nave, was next excavated. Four clustered pillar bases, with intervening sedilia, were discovered on the inside of this wall. These were set on the original bases; their mouldings were very sharp and beautiful in execution, and are shown in plan and section by M and N (plate II.) The outside of the wall had no base, and it is not improbable that there had been at one time a south aisle to the nave, and that in the square beyond it were situated the cloisters; no trace of the foundations of them were, however, found. Two drains leading from this area—the one through the chapter-house, and the other through the passage to the north of it—were laid open; the former was large, rudely formed, and flagged over; the latter small, and well formed, with paved sole and dressed side stones. These may have been used for conducting the water away from the lavatories. The southern lines of the church are not so well defined. The two apartments east of the western portion of the transept, and the one at its south end may have been used as the sacristy, chantries, or small chapels. The length of the nave and chancel together is 180 feet, and that of the transept over the end apartment 100 feet. The breadth of each is 38 feet. There is a passage 7½ feet wide between the south gable of the church and the chapter-house. The south door step and the internal angle pillar bases are still seen. The chapter-house, which is 20½ feet square inside, shows outlines of buttresses on the east side and south-east angle, and so far it has had clear elevations. In the internal angle at this corner, a portion of the base of the small pillar G (plate II.), already noticed, rests on a flat stone of very considerable size, judging from what is seen of it. (See B, plate IV.) On the top of it is cut the representation of a sword by a groove sinking, not very carefully executed, and part of the blade is built into the wall, thus showing that this figure had been cut on the stone before this portion of the wall was built. Whether this may be an original stone or not I cannot say; but may not this be the corner at which the foundation stone was laid? and this the cover? It looks different from the other stones.

In the centre of the chapter-house there is the base of an octagon pillar, 2 feet 7 inches in diameter, set on a square block, shown by E (plate II.) The mouldings in this portion of the ruins appear to be of the oldest style. The door is in the west wall of the chapter-house, and the steps up to the area bear marks of extensive traffic. On the south side of what I have described as the cloister square, is the foundation work of a large rectangular building, 70 feet by 21 feet inside, with buttresses on the south side, and a doorway with several steps leading down. The south wall had been faced with polished ashlar stone. The west end of this ruin has been most substantially built. It is scarcely possible to trace the different stones: the grouting is most complete, and resembles more a solid mass than a conglomerate. A great quantity of oyster shells have been used in the walls, and in the excavations deposits of them and river sand were turned up in several places. A small specimen of the grouting lime with a shell embedded in it lies on the table, and may be examined. There is also a slight indication of a door in the north wall nearly opposite to the other one. This ruin is very probably the basement work upon which the Abbot's new hall was built, and I think it is not unlikely, that another building stood at the cover on the east side of this one, and to the south of the chapter-house, extending eastwards to near the angle buttress. The west wall indicates a junction with the church, and I am of opinion that another building stood there in this connection, completing the cloister square.

The excavations were now prosecuted eastward in the direction of the river, and the ruins of a number of walls were brought to light. These appear to have been the office house or cellarage buildings. Farther north there is the ruin of what is styled the "dove cot." This ruin, which is part of the east gable and adjoining side walls of a large rectangular building, stands about 40 feet high, and is fitted up with catacomb divisions for a pigeon-house, and was evidently used for this purpose. The roof of the standing portion was a lie-to, facing the south. The extent of the ruins were not traced out here, but the undulations of the ground, justify at least the projected extent on plan westwards. Again, following the course of the operations, we find the workmen now laying bare the base course of the west end of the nave, the section of which is shown by E (plate III.) The upper member is of Norman caste. The west door arch, which is equilateral, is still standing; the jambs project in face of the wall, and have a return shafted column at each outside, a tooth ornament between these columns and the faces of the jambs, and a corresponding member and ornament to begin the ingoings of the jambs, which had each five columns with intervening members, principally filleted. The archivolt was elaborately moulded with deep hollow and roll and fillet members, and had one tooth ornament near the front. The whole doorway is in a very ruinous state, but nevertheless very picturesque.

I understand that it is the intention of the Patrons of Cowane's Hospital, to have the stone wall that encloses the graveyard (to which the arched door is the entrance) taken down, and replaced by an open iron railing. This will, along with the other improvements being made upon the grounds by them, very much enhance the appearance of this spot, and attract to it greater public attention. The level of the west door, taken in connection with the nave south wall clustered pillars, leads me to conclude that the floor level of the western part of the nave was lower than that of the transept. It is thought by some people, that after the Reformation some parts of the ruins had been used for Protestant worship. We know that some of the monks did embrace the Reformation faith. The base work of the tower was also exposed. The earth had accumulated all round to nearly four feet in depth. (See Elevations, plate IV.) This excavation showed a fine bold base course resembling that on west of nave, (see section on plate V.) and the ruins of a building on the east side. This ruin was evidently of an after-building; the walls were thin, and built over the base course of the tower; it had been a lie-to, for the traces of where the roof had joined into the tower wall, and had been let into the sides of the buttresses, were quite distinct. The head of a large oak pile was discovered at the south side, and near the tower staircase another similar log, but with a hole down its centre of about five inches in diameter. This is supposed to have been the down shaft of a pump. The water for the Abbey supply is said to have come from Craigmill, situated to the north of the Abbey and at the east end of the Abbey-craig, and the pow or track of this supposed water-run is still to be seen in some places. This channel may have been used for floating down stones from the craig. I was informed by a person, that when, some years ago, he was cutting drains in the field lying to the north of the ruins, he came upon a triangular lead pipe, which may have been one of the service water pipes; its shape showed, at all events, that it had been made before the drawing process in making circular pipes was discovered. In the wall near the staircase a recess had been formed; this was a subsequent work, and was like a place intended for putting water vessels into. The door into the tower on this side was original, and had the base course returned into it. This apartment was very likely built in the poorer days of the monastery. There had also been a gate across the space between the tower buttress and the church, in the line of the east wall. On the south side the bases of the original door shafts and jambs were discovered under the sole of the late door, which had been made of size to suit the existing levels of the accumulated earth rubbish outside and inside, and had a very depressed arch. In clearing out the inside of the tower, it was found that the walls had been faced all around with inner ashlar walls, supporting the vaulting overhead, and that these walls were founded above the original floor level (see section of Tower, plate V.), and were consequently of a much later date.

Before passing on to describe the restoration of the tower, I would briefly say, that the Abbey was founded in 1147, pillaged about 1350, burned down in 1383, very poor during the close of the fourteenth and early part of the fifteenth centuries, restored during the fifteenth and early part of the sixteenth centuries, and again demolished in 1559 by the votaries of the Reformation faith;—that the Abbey church was cruciform in plan, the restoration of it following closely the foundations of the original;—that oak logs and small piles were used under the original foundations, and the stones were of light and dark-brown freestone, of fine and coarse qualities, and evidently from different quarries, perhaps principally from the Abbey-craig quarry and other local quarries;—as the district is famous for its freestones; that the hewn stones were neatly cut, carefully carved, squared on their beds and joints, and deeply channelled on all their contiguous faces for *griping the lime and taking band* (and it were well that this were more attended to by architects at the present day);—and that the walls were faced outside and inside with dressed stones, were most thoroughly grouted, and had large quantities of oyster shells used along with the mortar. And here I would state that, in clearing out the joints of the tower coursers, these coursers, which were hewn on the inside of wall and hammer-dressed on the outside face, were found to have a good thickness of lime mortar between them full of shells. The shells had either been carefully set between two thin layers of mortar, or had been pressed in from the outside after the stones were set, and then pointed over. It is currently affirmed, that several of the old buildings in Stirling, were built with the stones from the ruins of the Abbey. There is no doubt, however, that many of the stones have found their way into the walls of the houses in the village of the Abbey: these can be easily pointed out. An effigy label termination and a canopy stone, form the only ornamention in two of these houses; and other moulded stones are lying about the doors and gardens.

During the excavation, Treasurer, now Bailie Rankin, a gentleman of good taste and public spirit, was most diligent in looking after what might be turned up; that nothing should be lost, nothing be destroyed, and nothing be permitted to hinder the workmen. I found his advice most useful, and his co-operation most encouraging and valuable. He is still the custodier of the smaller relics found.

Several years ago the ruinous condition of the Abbey tower was brought under the notice of the Hospital Patrons, the Town Council of Stirling, and they resolved that it should be entirely re-pointed. The lower part of the tower at this time, was used as an implement shed by the Forth Navigation Commissioners. The head-room of the entrance door was not very ample, and it was with difficulty that an adult could get through the door leading to the staircase; on account of the *débris* collected inside. The ground-floor apartment is vaulted over, as already noticed, and there is a circular opening about four feet in diameter left in the centre, to admit of bells passing through it. The vaulting is of clean hewn stone, and in good preservation. When the vaulting with its supporting walls had been put up it is difficult to say, but about the middle of the fourteenth century the belfry had been struck with lightning, and perhaps the *rents* visible on the small scale elevations resulted from this. It is also probable that the turret part of the staircase was knocked down at that time. I am perhaps in error in this supposition; but the circumstance of the outside of the staircase being octagonal below the third-string course, and heptagonal above it, has induced me to think this. However, so far as the external appearance goes, the work seems in a piece; and so this may have been a part of the original design, perhaps *symbolical* of the days of the week. Most probably the inside vaulting and casing walls were put up to strengthen the tower, after it had been thus damaged.

On plumbing the tower, I found that it inclined about seven inches to the east and three inches to the north; the base courses of the buttresses were pointed upwards at the outside by the sinking of the walls, and more so on the sides, to which the tower most inclined. All the light to the ground-floor apartment was by two loop-hole openings; the original windows of it had all been built up, their labels broken off, and faced up so as to look like an unpierced portion of the wall; the remains of these I, however, searched out under this facing, and afterwards had them restored. The south door gablet looks rather like an after addition, but I have failed to prove this; as it chimes in properly with the wall building, and is securely banded into it, but the base course does not return round it. One side of it was very much dilapidated, and a bush had taken possession of a hole in the gable weathering, and was thriving well there. To the right of this door is the slide-hole into which the door bar was pushed when the door was unbarred, the outer facing of the stone concealing it having given way. To the left a door had been broken through the wall on the level of the first floor, and above it are marks of a roof having been let into the tower wall.

I consider, therefore, that there had been a covered platform passage between the tower and the restored church at this place. The paving of the first floor had all been removed, and the stones of the groined arches were visible above. The original windows of this room were all built up except a portion of the east lancet. A large square opening was left in one of the south triplet windows, which was stanchioned with iron; a small hole was left in the other, and a similar window to the first broken through the north elevation; a fire-place was also put into the south wall. This apartment must have been at some time occupied as a dwelling. The position of the second floor and corbels under are shown by the dotted lines on section (plate V.), but the floor was gone, and so above the first floor the tower was open to the roof. This room had been lighted by two small common-shaped windows in the west and north elevations, and had also a fire-place. Of the eight belfry windows, the two south and one of the north ones were entirely shut up; the south two were converted into fire-places and flues, and the north one was converted into a press; the remaining windows had had small rectangular windows formed in them. I think the tower had been inhabited about the middle of the fourteenth century, from the historical notice of that period. The south wall had been slapped up for the formation of these flues. The original windows were taken advantage of for this purpose, and their arch stones were accordingly cut out for the flues passing up, and this weakened very materially the stability of the tower. This was a sufficient reason of itself for producing the long crack seen in the south elevation, apart from the other cause referred to. The top parapet wall was in a very dilapidated state; large bushes were growing out of the wall at the top; and had it not been for the roots of these bushes holding the split and bulging-out portion of the wall under the parapet corbelling together, it would certainly have fallen out, and that most likely when some person was standing over it. The gables of the roof had built into them at their base many of the stones belonging to the original parapet wall and coping, and so cannot be looked upon as original; they were crow-stepped; and the crow-step stones were, like all the other weathering and moulded stones, very much decayed.

Considerable difficulty was found in restoring the tower, but the moulded stones were all searched out with great trouble, to enable the restoration to be completed true, as shown. In opening up the north belfry windows, a great number of finely-hewn and carved stones were found, and are represented by figures G, H, I, K, and R (plate III.), and by the canopy on plate IV., of which R is the mullion. This canopy is most beautifully cut in fine white freestone, and its lines are as sharp as when executed. The backs of these stones were placed so as to form the inside face of the wall, and the carved work was built into the heart of the wall and enveloped in mortar. These were evidently built into these windows with a view to preserve them. The stones have the appearance of being part of mural panelling, and may have been placed at the side of the chancel. The figure marked Q (plate III.) is a fragment of the belfry mullion, and other sections of the tower mouldings will be found on plate V. The groining at the top of the staircase is very chaste, and much admired by visitors. The plan of the vaulting, looking up, and also a perspective view of it as seen in going up stairs, are represented on plate IV., and likewise a plan of the top of the stair turret, showing the manner in which the heptagonal portion of it rests on the octagonal; the exit door to the roof paved walk, and the arrangement of the steps at the top of the stair.

To the irregularity of the topmost ten steps I wish to call special attention. Is this irregularity a mistake, or was it designed? I am of opinion that it was designed; for if the steps had each been made of the average size, they would have landed at the same place. But if it should be asked why the three steps marked 10, 8, and 3 should have been so wide, and the others so cramped as to injure the stair? I answer, that from each of these *broad steps* a *different view* of the groined roof is obtained;

and these, I am strongly inclined to believe, were purposely made broader than the others, that they might become *resting-places* for viewing the beautiful groined work over head.

The pointing and repairing of the tower was commenced on the 16th of May, 1865, by the orders of the Town Council of Stirling; but as the old joints, both outside and inside of the building, had all to be cleared out, and as many of the decayed stones and mouldings were thereby destroyed, and much of the tower was then weak and in a very dangerous condition, it was found absolutely necessary to combine the restoration with the above work, and nothing else would either have been satisfactory or sufficient. This work of restoration is now just completed, and I have endeavoured to carry it out truthfully. Every moulding restored is as near a facsimile of those replaced as it was possible to make it, and the whole building is now thoroughly restored and made secure; and if properly cared for, may last a few centuries more. The tower is 22 feet square inside, and the top of the parapet wall is nearly 70 feet above the ground floor. The south-west corner of the parapet has a peculiar corbelling (shown on plate IV.), and the face corbellings consist of nondescript heads. The lower and first floors have been formed of composition. Stone sedilia have been put round the ground-floor apartment, to conceal and protect the foundation stones of the inner walls, and this is done in imitation of the sedilia at each side of the upper windows, to the form of which your attention is now directed. (See Tower section, plate V.) A new wood belfry floor has been put in, and a flat roof constructed over the centre, leaving space round it and within the embrasure parapet wall, for an easy walk or pavement; and thus allowing a clear view of the country around. Whatever materials were found not belonging to the original structure were removed; the introduced fire-places and flues were built up; the broken window arches rebuilt; deficient portions of the walls taken down and reconstructed; new doorway, string courses, buttress weatherings, window mullions, tracery, and necessary soles, jambs, arch stones and labels, and the embrasure parapet wall, paved walk, gurgoyles, and turret gablets, were renewed; and the whole walls properly strengthened.

The work of restoring was a most difficult one: information had to be gathered from every step in the operations. A considerable sum more than was at first contemplated, was consequently expended in accomplishing this restoration. The tower windows have all been filled with glass, the wood work stained and varnished, a protecting railing put round the bell opening on first floor, and the fragments of stones found in the excavations and otherwise, laid out in the different rooms for the inspection of visitors. The sum expended exceeds £1,200., and has occasionally been grudgingly spoken of; and without looking into the details of the work, this is not at all surprising. All agreed that the tower should be pointed; but surely to have pointed a fast-falling fabric would have been no economy. The increased value of the rental of the gardens and feuable lands, arising from the restoration and other improvements, will soon yield a fair compensation to the Hospital for its funds thus expended, and be at the same time another monument to the memory of its founder, John Cowane. The greatest credit is due to Provost Murrie, to Messrs. Morison and Low, successive Chairmen of Committee, and to the other members, who represented the Hospital Patrons in this matter, for the liberal spirit they displayed in this work, and the attention and time they bestowed on its progressive requirements.

I fear that I have taken up too much of the meeting's time with the foregoing details; but I crave excuse on this account, that much of the subject of my present notes and observations has already, by the extreme severity of the winter, become entirely pulverized, and the walls too, so recently laid bare, are again being rapidly enshrouded in a mantle of green vegetation; so that this record will, in all probability, be the fullest, if not the last, of the ruins of Cambuskenneth Abbey.

I cannot close these notes without stating that, shortly after the discovery of the resting-places of King James III. and his Queen, Princess Margaret of Denmark, a correspondence took place between

Provost Murrie of Stirling and the Home Secretary, in respect to the Royal remains; in which the former urgently recommended, that a memorial should be erected to the Scottish king and queen. The result was, that Her Majesty was graciously pleased to order a suitable memorial stone to be prepared, and erected to her Royal ancestors at her own expense—an act which affords an additional proof of the veneration, generosity, and magnanimity of our beloved Sovereign. This memorial stone was designed by Mr. Matheson, H.M. Surveyor to the Board of Works; and executed by Mr. Rhind, sculptor, Edinburgh. It cost upwards of £160.

On the 23rd of September, 1865, the following gentlemen met to witness the re-interment of the Royal remains:—John Murrie, Esq., Provost and High Sheriff of Stirling; Bailie Rankin; Councillor Christie; J. D. Marwick, Esq., City Clerk of Edinburgh; Ex-Bailie Thomson; Mr. Rhind, sculptor, Edinburgh; and myself. The box containing the remains was then handed over by me to Provost Murrie, who opened the seals, and shewed the contents before they were placed in the receptacle prepared for them; the box was then shut and deposited in the memorial stone, which is of the sarcophagus form; its cover was lowered down, properly set, and the work pronounced completed.

This tomb-stone is beautifully sculptured in fine freestone. It is situated between the Royal graves and immediately in front of the high altar, and is about 8 feet long, 4½ feet broad at base, and stands nearly 4¾ feet high. On the top of the cover is a raised cross; on the north side the following inscription is cut in appropriate raised letters—"This restoration of the tomb of her ancestors was executed by command of her Majesty Queen Victoria, A.D. 1865." On the south side is the following—"In this place, near the high altar of the Abbey of Cambuskenneth, were deposited the remains of James III., King of Scots, who died on the 11th June, 1488; and of his queen, the Princess Margaret of Denmark." On the west end are the Scottish arms, with the motto, "*Nemo me impune lacessit;*" and on the east end the Scottish arms quartered with those of Denmark, entwined with representations of the thistle. The monument is now enclosed by an iron railing, and surrounded with stone pavement. Sir W. Stirling Maxwell, M.P. for Perthshire, who all along took a lively interest in the excavations and restoration, gave a handsome donation towards the cost of railing, and of improving the grounds. The accompanying stereoscopic views will convey to you a correct impression of the Royal memorial, and of the beautiful locality in which the ruins of the once famous Abbey of Cambuskenneth are situated.

The Chairman (Mr. JAMES FERGUSSON, Vice-President), having invited discussion on the subject—

Mr. DAVID BRANDON, V. P., said, as no one seemed to be sufficiently acquainted with Cambuskenneth Abbey to elicit further information on the subject, he rose to propose a vote of thanks to Mr. Mackison for the interesting paper he had sent them. He joined in the Chairman's expression of regret at the absence of the author, inasmuch as the interest of the paper would have been enhanced by a reference to the illustrations by which it was accompanied. The paper partook more of an archæological than of an architectural character, and in that respect differed somewhat from those which were ordinarily brought before the Institute; but, inasmuch as variety was pleasing, he, for one, hoped it might be repeated on other occasions.

Mr. JOHN P. SEDDON, Honorary Secretary, had great pleasure in seconding the vote of thanks to Mr. Mackison, and in stating that the paper would be accompanied by the illustrations in the Transactions. As far as he could judge from the drawings, this detached tower was one of singular interest. It seemed to be of great breadth actually as well as in effect, being nearly 35 feet square; and its details of the early English style had a magificent effect. The parapets struck him as being peculiar, and if Mr. Mackison had been present he would have liked to have asked him whether there was a probability of their being of the same date as the rest of the building.

Mr. E. B. Lamb, Fellow, said, with reference to the paper generally, they were very much indebted to the gentleman who had taken the trouble to go so deeply into the historical matters connected with this building. He seemed literally to have left no stone unturned in order to furnish materials for a very elaborate historical and archæological paper; and though he considered archæology of less importance than architecture to the Institute, yet he felt that their thanks were due to the author of the paper for the deep research he had bestowed upon the subject.

Mr. C. F. Hayward, Honorary Secretary, said their thanks were due to the gentleman who had written this paper, because he had given them an account of what architectural details still remained in the Abbey, and even more perhaps than existed at this moment, for many of them were described as in a perishing condition and almost as soon as discovered began to be lost again, being gradually grown over with foliage. If it had not been for the care and pains Mr. Mackison had taken in making drawings of them, many of these details would probably not have been visible to those who, led to feel a special interest in the matter by the paper just read, might travel to these ruins in the present year. He (Mr. H.) considered it essentially one of the departments of this Institute that they should have one or two Papers of this description every session, if they could get them, inasmuch as they preserved important facts in the history of our country and of architecture, which might not be otherwise recorded. Prizes were given by the Institute to obtain such information as they had received from Mr. Mackison, and he (Mr. H.) knew the great trouble that gentleman had taken in preparing the drawings and getting up the paper, to say nothing of his sending specimens of materials used in this building, which were of great practical interest. He would have liked to have some further explanation with regard to the wooden logs spoken of, and to have learnt whether they were really put in to steady the building, as stated, or for some other purpose; and, as that they did not seem to be in the least decayed, he should like to know the object in removing them all, except for the sake of curiosity. In addition to these smaller matters, had Mr. Mackison been present, there were many practical points of interest which would no doubt have been elicited. The Paper might perhaps be of a more archæological character than some members desired, but he felt that special thanks were due to its author.

The Chairman had great pleasure in putting the vote of thanks. As he had no personal knowledge of Cambuskenneth, he could add nothing to the information given of it in the Paper; and would not detain the meeting further than to say he believed the Paper, perused in the closet, and accompanied by the illustrations, would be found more interesting than when read *viva voce*. There were historical records in connection with this building of great interest, and well worthy of all that had been said of it.

A vote of thanks was then accorded to Mr. Mackison.

ON THE CHURCHYARD CROSS.

By the Rev. E. L. Cutts.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, March 11th, 1867.

Had we lived in the middle ages, in travelling through England, passing one churchyard and another, we should have sometimes seen two, three or more tall crosses of stone or wood in the same churchyard. I say this, because in pictures of the Judgment Day in illuminated MSS. we find representations of three or more crosses in the same churchyard. At Penrith there are still two, and in some of the churchyards in Ireland; at Whalley churchyard there used to be three. But the traveller through Mediæval England would have found in every churchyard one tall cross—not a sepulchral cross, but a part of the regular furniture of the churchyard.

In the first place, I propose to inquire what was the origin of this universal piece of churchyard furniture, and what was its meaning. In looking back for its origin we find evidence of a fact which, to my mind, is very interesting, viz.:—that these churchyard crosses existed, in many cases, before the churches themselves existed. I do not mean that we find sometimes a very ancient cross where there is a more modern church, but that in some cases a churchyard cross existed in a portion of ground devoted to sacred purposes long before any church was built on that spot, or anywhere in that parish. The way in which this came to pass was as follows:—The missionaries who converted our Saxon forefathers, addressed themselves first to their kings, as our missionaries in South and Central Africa now address themselves first to the native chiefs of that country. Each king of the Heptarchy, as he was converted to the faith, encouraged the Missionary Bishop and his staff of clergy to settle at the chief town of his kingdom. He helped them to build their rude wooden cathedral church, and their common home adjoining, and he endowed the Cathedral with lands and manors for the support of its clerical staff. At first the Bishop and his clergy lived together under the shadow of their Church in the royal town; and thence the Bishop sent his clergy, and went himself as need required, on missionary journeys through his diocese, which was conterminous with the kingdom of the Heptarch who had taken them under his protection. The itinerant clergy visited the villages and hamlets thinly scattered amidst the Saxon forests. They naturally addressed themselves first to the thanes, around whose manor houses the rustic population was grouped. Wherever they succeeded in gathering together a little company of believers, there they revisited them from time to time, to minister to them the word and sacraments, and they gradually extended their operations wider and wider among the scattered people, as opportunity served. Wherever they were accustomed to visit their congregation at stated periods to administer the ordinances of religion, they erected a cross at the usual place of assembly, partly to mark the place, and partly no doubt to consecrate the spot to holy uses. The baptismal fonts were of the most primitive kind; baptising being performed by immersion, they no doubt chose some neighbouring spring or rivulet for the purpose; the missionary probably stood beside the cross as he preached, and for the celebration of holy communion a portable altar was placed upon moveable trestles in front of the cross. The churchyard cross therefore served an important purpose in these primitive open-air churches. We look upon the altar as the essential portion of a church, but then it was the tall cross, which marked and consecrated the place where it stood as one of those Bethels where God is pleased especially to receive the worship of his people.

But another remarkable fact is that when the parochial system of settled pastors was introduced by Archbishop Theodore in place of this missionary system of itinerant preachers, and when a house and glebe was assigned to the Rector in each manor, it was only in some places that churches were built for the honour of God and the convenience of his worshippers. In many places the people continued still to assemble in what I have called their open-air churches. The peasantry were engaged in the fields, and the gentry occupied themselves with field sports. Nor was their indoor life spent in small well-warmed rooms. The old Saxon hall in which the whole family of a Saxon landowner assembled, was not unlike a substantial modern barn. The fire was kindled on a hearth in the middle of the room, the windows were unglazed; so that even their indoor life was less enervating than ours; and it was not so great a hardship to assemble out of doors on a fine day for public worship. Of course, like ourselves, they were liable to showers of rain, and I have often puzzled myself to imagine what they did when one happened during the time they were assembled. I have sometimes wondered whether the yew trees, which so commonly in old times stood beside the churchyard crosses, were partly intended, or at least were used, to afford a temporary shelter both from the winter rain and from the heat of the sun in summer.

The assertion that the Saxons did use such open-air churches, in which the churchyard cross was the only architectural feature, is not a mere speculation of mine; there is ample ancient testimony that this is a correct statement of the origin of many of these crosses. In the life of S. Willebald, in the description of a miracle said to have occurred before one of these crosses, the following passage occurs:—"It is the custom of the Saxon race that in some of the estates of their nobles and chief men, they are accustomed to have, not a church, but the sign of the holy cross, dedicated to the Lord, esteemed with great honour, erected on high, for the fitting celebration of daily prayer." Again, in an Irish ecclesiastical canon of the eighth century it is ordered "That a cross be set up wherever there is consecrated ground, to mark the extent as well as the sanctity of the spot." One cannot help trying to picture to oneself one of these primitive congregations; the priest standing beside the tall carved cross, and the people grouped irregularly round,—men, women, and children, some standing and some sitting on the turf. They had a picturesque church at least, though a primitive, and in some respects, an inconvenient one; for their pillars they had the trunks of the forest oaks, the forest glades with their arching branches for their long-drawn aisles, the green sward studded with flowers for their tesselated pavement, the variously coloured foliage for the polychromatic decorations of their walls, and the patches of blue sky for their roof. Those whose business it is to design the coloured decoration of our churches in the present day might, I think, do worse than picture to themselves these primitive churches, and borrow suggestions as to their colouring from them.

A few other notices of later date occur, for example,—one of the institutions of William de Blois, Bishop of Winchester, dated 1229, says,—"Let a handsome cross be erected in every churchyard, to which the procession shall be made on Palm Sunday;" and in 1501, Henry Baun by his will orders a cross to be set up in Hardley Churchyard, Norfolk, "pro palmis in die ramis Palmarum offerendis." When erected, it was the duty of the parish to keep them in repair, together with the fabric of the church and the churchyard; and their condition was enquired into by Archdeacons, and presented by Churchwardens at the regular visitations. For instance, in the York Fabric Rolls we find such entries among the Churchwardens presentments as "crux fracta."

The situation of the churchyard cross was usually on the south side, near the path which led to the south door, *i.e.* near the path by which the majority of the people entered the church. Its meaning in the eyes of the men of the Gothic period probably was only one of appropriate symbolism; it hallowed the churchyard, it reminded the worshippers as they approached the church of the great fact of their religion, and was calculated to solemnize their minds. An old book, "Dives and Pauper," date 1496, says, "for thys reason been crossys by the waye, that whan folke passyng see the crosses they should thynke on Hym that deyed on ye crosse, and worshippe Hym above al thynges;" this is said of the wayside crosses, but is equally appropriate of the cross which stood beside the churchyard path.

A considerable number of these ancient crosses still remain; indeed I believe their destruction was not, as some think, the work of the Reformers: it was rather, I think, the work of the Puritans who succeeded the early Reformers. One proof that it was not the work of the Reformers of the sixteenth century is this,—that so many of these crosses continued to exist after their time; and there is evidence that very many did exist. If you refer to Speed's "View of the most famous places of the world," which contains maps of the English Counties, in the corners there are a sort of bird's eye views of the principal towns as they were in 1610. You will find there the pillories and may-poles and crosses all put down; usually, a cross at each principal entrance to a town, and another in its market place, and others in the churchyard; even in the few towns of which views are given you find a considerable number of crosses, not one of which perhaps now remains; and in many village churchyards and on village greens the ruins of them still exist; so that in the reign of James I. there must have been hundreds, nay thousands, of them scattered all over the country. Their destruction began some thirty years later.

An incident recorded in the Life of Baxter (folio, 1696, p. 41), gives us a graphic sketch of the way in which this destruction was effected, and of the scenes which sometimes occurred. "About this time [*i. e.* 1640] the Parliament sent down an order for the demolishing of all statues and images of any of the three Persons of the Blessed Trinity, or of the Virgin Mary, which should be found in churches or on the crosses in the churchyards"—another evidence that the churchyard crosses were still commonly existing unmutilated,—"My judgment was for obeying of this order, thinking it came from just authority, but I meddled not in it, but left the Churchwarden to do what he thought good. The Churchwarden (an honest, sober, and quiet man) seeing a crucifix upon the cross in the churchyard set up a ladder to have reached it, but it proved too short; whilst he was gone to seek another, a crew of the drunken riotous party of the town (poor journeymen and servants) took the alarm, and ran together with weapons to defend the crucifix and the church images, of which there were divers left since the time of Popery."

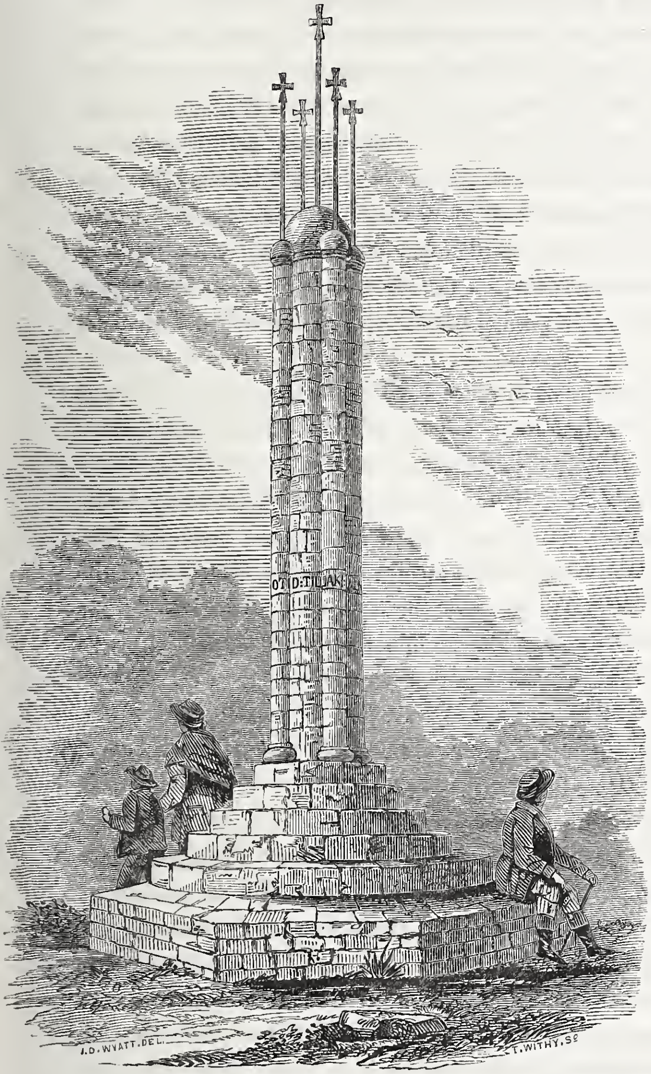
At the restoration of the monarchy and church, many of the mutilated crosses were repaired. There is an interesting example at Lynby, in Notts; it is not indeed a churchyard cross, but the wayside and village green crosses are so identical in design with the churchyard crosses, and have shared the same treatment, that it is allowable to illustrate one class by the other. On the village green, at the upper end of the village street, not far from the church, is the broken shaft of a cross, rising from a base of six or seven octagonal steps, the "risers" ornamented with quatrefoils, and beside it the village maypole still stands. There is a clear lively stream of water flowing down each side of the wide straggling street, with little wooden bridges across to the cottages and farm-houses and the village inn. Towards the lower end of the street the two streams disappear, unite in one stream underground, and re-appear at the lower entrance of the village, gushing forth in a mimic cascade from beneath the base of a perfect cross which is overshadowed by the foliage of a couple of elm trees. A beautiful symbol is thus suggested,—the Water of Life flowing forth from the foot of the Cross. On the other side of the cross is a date, 1663; it was repaired, therefore, immediately after the Restoration, probably by the loyal Byron.

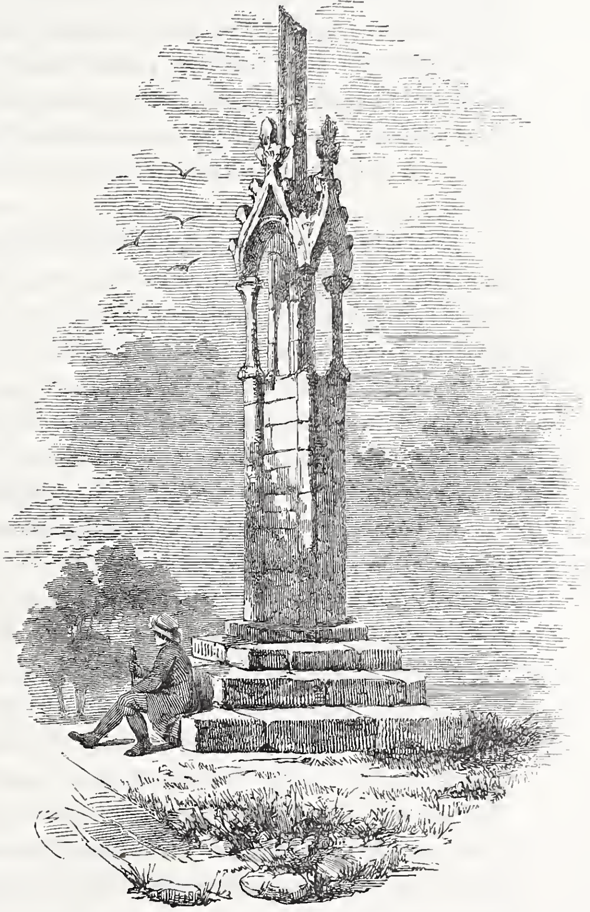
We must not, however, attribute the destruction of all the crosses to the Commonwealth Puritans; the order of the Parliament, we have seen, was limited to the demolishing of all statues and images of any of the three Persons of the Blessed Trinity, or of the Virgin Mary. Probably another ordinance against superstitious images led to the demolition of many other crosses which terminated in decorative sculpture illustrative of Scripture history and saintly legends; but a considerable number of crosses which exhibit only the symbol of the faith are still left uninjured. It is probable that many of the crosses were ruined by the ignorance and carelessness of those who did not take the trouble to repair them when they was dilapidated.

But in spite of the demolition of Puritanism, and the destruction of time, and the neglect of indifference, a considerable number of examples of ancient crosses still remain, in a more or less perfect state; some of them are highly curious for their antiquity, and for the sculpture and inscriptions upon them; and many of them are beautiful in their design and execution. A glance at a collection of drawings of these crosses is enough to show that they are naturally divided, by strongly-marked characteristics of design, into two broad classes. In one class we at once recognize architectural forms and ornaments of the same character as those with which we are familiar in our Gothic churches; in the other class of designs the forms are rude and primitive, and the ornamentation of barbaric taste. We may call them the pre-Gothic and the Gothic classes. But it is desirable to say at once, in order to prevent error, that many of the crosses of pre-Gothic design are of Gothic date; for in many remote parts of the kingdom the earlier types of design continued to be used throughout the Gothic ages, and even down to a very recent period. The great majority of the pre-Gothic crosses consist of a tall shaft, let into a great block, more or less rudely shaped, and surmounted by a cruciform head, and on this cruciform head we commonly find a combination of the cross and circle. Sometimes a plain circle of stone encloses the limbs of the cross within its circumference; sometimes it is as if a slender ring of stone pierced through the massive limbs of the cross to bind them together. Frequently the shaft of the cross, and sometimes the head also, is ornamented with sculpture in low relief. This sculpture is usually purely ornamental; panels filled with geometrical patterns, formed by interlacing bands; foliage running in scrolls from bottom to top of the shaft; sometimes this foliage, with a beautiful significance, represents the vine, in manifest allusion to the True Vine, whose blood was shed upon the cross; sometimes grotesque animals are introduced, half lizard, half serpent, whose tails terminate with interlaced bands; animal forms and hunting scenes occur; more rarely there are human heads, or full-length figures, or scriptural and legendary scenes; and, occasionally, inscriptions occur to tell by whom and on what occasion the cross was erected. The ornamentation on these crosses is of precisely the same kind as that which we find in the great initial letters of the illuminated MSS. of the Irish and Saxon Schools; there can be no doubt that many of the crosses are of very early date, ranging between the seventh and twelfth centuries.

The Gothic class of churchyard cross is usually of very different design. In the pre-Gothic type, as we have seen, the proportions are massive, and the cross-form of the head is simple and well developed. In the Gothic, the base and shaft are more slender, elegant, and architectural in design; and the head is rather a piece of elaborate sculptured tabernacle work than a mere cross. There are often little details of moulding or ornament which enable the antiquary to assign a cross to the thirteenth, fourteenth, or fifteenth century; but the general character of their design is the same throughout the Gothic period. The typical form is a base, consisting of three or more steps, square, octagonal, or more rarely round, in plan; upon this is placed a plinth, which is often ornamented with sculpture. From the plinth rises a tall tapering shaft, square or octagonal in section, and sometimes enriched with sculpture; the shaft has very commonly a capital, and upon the capital is carried the crown of the design. Few of them are now perfect, but there are a few; and in many hundreds of instances the base and broken shaft remain, and seem to invite restoration. From the few that remain perfect in England, and from others which are to be met with abroad, we gather that sometimes the crown of the design was a foliated cross; sometimes there was a crucifixion on one side of the cross, and the Virgin and Child on the other; but most commonly there seems to have been a piece of tabernacle work, containing a group of saints or sacred personages arranged under ornamental canopies. We give a representation of a cross which has somehow escaped destruction, from Somersby, Lincolnshire, which has the peculiarity of a little crocketed and gabled canopy of stone placed over the cross to protect the figures beneath. On one side of the cross is a figure of the crucifix, on the other is the Virgin and Child. It looks as if the graduated base of the cross were hidden under the soil which has accumulated about it. Another perfect cross is preserved in the grounds of the old episcopal palace at Lincoln, where it occupies the southern slope of the hill, crowned by the glorious minster. It stands in a picturesque little grassy hollow with trees around; the ruins of the old palace, with the towers of the cathedral rising high behind them, form the background of a charming picture.

The mutilated crosses often supply us with valuable varieties of design. The example below is from the neighbourhood of Doncaster, in which the shaft is a clustered column of thirteenth century character, built up of many stones, with a band of inscription round it. The same neighbourhood contains another example, in which the main pier is square on plan, with attached shafts at the angles, supporting a square canopy, from which rises a slender shaft, crowned at its apex by a terminal cross. Both these designs are valuable for their suggestiveness.





The great majority of the churchyard crosses were merely ornamental and symbolical; but, just as the town crosses were sometimes developed into a shelter for the market people, and became market crosses, so we find a few curious examples in which the churchyard cross has undergone a similar adaptation. In some instances it was developed into a pulpit, and became a preaching cross.* St. Paul's cross is the most popular example of the preaching cross; a woodcut of it, with some popular bishop preaching before the Corporation of London, has been so often published that it is probably familiar to our readers.

But preaching crosses exist in many other places besides St. Paul's churchyard. There is a picturesque example still remainining at Hereford, beside the ruins of the Friary of the Dominicans—the

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* The Bishop of Lincoln suspended Swynderby, the Wycliffite hermit priest of Leicester, from preaching in any church or churchyard in his diocese.

Preaching Friars, *par excellence.* Such preaching crosses were not confined to cathedrals and convent yards. There is a very handsome example of one of the fifteenth century in Sion-Acton churchyard, Gloucestershire. The base is polygonal, rising in two steps; upon the upper step stands a tall square canopy, composed of angle piers, carrying ogival arches. Three of the open sides of this canopy have a slight transom of stone, at half the height; the fourth side forms the door by which the preacher entered it; its floor is raised a pace above the base, and there is a little step outside to facilitate the preacher's entrance. Above the canopy rises an ornamental shaft of the ordinary kind, broken off at half its height. The churchyard cross at Rampisham, Dorsetshire, seems also to have been a preaching cross, but of a different fashion. It consists of the remains of a cross elevated on three ranges of steps, to the east side of which is annexed a long stone like an altar-tomb; but from the four holes in it and in the steps, it seems rather to have served as a place to preach from, and to have been covered with a temporary pent-house or awning. Round the four sides of the base is an illegible inscription in black letter.

Of the earlier crosses I have already said very many examples exist, of the later ones fewer are left perfect; but I have no doubt if they were searched out more would be found than are generally imagined to exist; and seeing how interesting and how beautiful many of them are, it is a matter of surprise to me that nobody has taken the pains to collect these examples together and publish them. One reason why I selected this subject to bring before you to-night was the hope that I might induce some one, who had the leisure and the means, to take it up and tell us more about it, supplying illustrations of the best examples. There is a considerable amount of material for the purpose, and if the matter were properly dealt with, it would make a very interesting work. [The Chairman here remarked that Mr. Cutts himself was the person to undertake the work.] I can only say if the Members of this Institute will furnish me with such drawings and information as they are able to procure, I shall be happy to contribute my share of the work; or if gentlemen who have drawings of these crosses in their sketch books would allow me to have copies made of them, I should feel much indebted to them.

Another object which I had in view in bringing this matter before you, was to ask why these crosses should not be restored. I hope I am not, in putting this question, trespassing upon dangerous ground. We have in the present age of enlightenment dismissed the prejudice which once existed against the use of the cross. Nobody builds a church now without putting crosses on the gables and other parts of the structure. We find them not only on churches, but on the religious buildings of other denominations of christians, and I hope there is no need in the present day to enter into a defence of this sacred symbol. The English people are, I venture to say, even in these days of novel Reform Bills, a very conservative people; and they have a liking for old customs and usages, and a disposition to retain them where they are harmless, without inquiring too closely whether they are of any great use or profit. The fashion of erecting churchyard crosses is a venerable and harmless custom—they were not removed by the Reformers; those which had objectionable images were broken by the Puritans; they were repaired at the Restoration, and some of us would be content to preserve, repair, and renew them for their own sake. But this is the lowest ground to take; the restoration of the churchyard cross is to be defended on higher grounds. Take the case of the church itself. When you build a church you take pains, provided the means are at hand for doing so, to decorate the church inside and out in a fitting and appropriate manner. If you bestow such pains upon the church itself, why should not some pains be bestowed upon the churchyard—the courtyard in which it stands. You bestow pains upon the church because it is a building dedicated to the service of Almighty God, and because of the religious associations connected with it. But why should you leave the churchyard in the disgraceful and neglected state in which many of them are found. If a gentleman built himself a handsome house he would be very dissatisfied to have his courtyard in disorder and overrun with nettles and weeds. Why then should the churchyard, which is the court yard of the church, be allowed to remain in a neglected state and overgrown with weeds. For my own part I cannot see why we should not have churchyards as carefully turfed and planted and tended as our gardens, which is the more easily done now that intramural interments of the dead have been done away with. Then, I think, one would hardly be content that the churchyard should be treated merely as a court or garden, without anything to denote that it is the courtyard of the House of God. Our forefathers held these churchyards in veneration on that account, and they erected these churchyard crosses to inspire solemn thought in those who passed by as they went up to worship.

I will only say one word more as to the architectural reasons for the restoration of the churchyard cross, and that is the reason of its architectural beauty. Place one of them in the midst of a well-kept churchyard, rising amidst the turfed graves, and bearing the symbol of faith and hope aloft over them, shadowed by the foliage of sombre yew or forest trees, with the gray walls and traceried windows of the church in the back ground, and it becomes a beautiful feature of architectural design.

The Chairman, Mr. T. H. LEWIS (Vice President), said he was quite sure they would have an interesting address from Mr. Cutts, and in that they had not been disappointed. Before the vote of thanks to that gentleman—in which he was sure all present would agree—was put, he saw several members who were qualified to give further information on this subject; and no doubt they would wish to offer some observations upon it.

Mr. W. WHITE, Fellow, said he was very glad to avail himself of the opportunity to propose a vote of thanks to Mr. Cutts, for his, to him, most interesting paper, from which he thought many present must have learnt something which they were not aware of before. He could say that personally, although he had seen a great number of village crosses, perhaps more almost than anybody in the room who might not have had the opportunity of living for four or five years in Cornwall, seeing that throughout the whole of that county, and for a few miles beyond the eastern portion of it, there was scarcely a parish but what had its churchyard cross, and many of them more than one; in fact, he believed that, including those at the wayside, there were in Cornwall literally as many crosses as there were churches, if not more. The wayside cross partook of the same character as that of the churchyard cross; and perhaps on that account Mr. Cutts did not think it worth while to call attention to the difference in the classification.. He was most glad to propose a vote of thanks to Mr. Cutts, because he had brought before them one point which he (Mr. WHITE) thought they were very apt to forget. They were apt to look upon architecture according to its mere external expression of beauty, excepting when they came to habitable dwellings or buildings which require great strength. Everybody said "We must first consider their fitness, usefulness, and construction." These indeed were important considerations; but he must add that in dealing with the subject of church architecture, they could not escape from or put out of sight those deeper views of the question which were to have their representation in that architecture; and unless they took that view and kept to it in their churches, they would not have any of that dignity and solemnity which all the churches of the olden days had, although they might be convenient, useful, pretty, ornamental, and even handsome. They would be sure to lack those special characteristics which ought always to embody their ideas of church architecture. For that reason he had great pleasure in proposing a vote of thanks to Mr. Cutts for his interesting paper.

Mr. JOHN P. SEDDON (Hon. Sec.), in seconding the vote of thanks, remarked that were several gentlemen present who he believed could materially aid the endeavours of Mr. Cutts in procuring illustrations and notices of existing churchyard crosses. There was hardly a village in Monmouthshire which had not some remnant of a churchyard cross. Most were more or less destroyed, but many were still exceedingly stately. In almost all cases the lowest stone was preserved, and, in some instances, there were magnificent sets of steps. He was not sure whether Mr. Cutts had mentioned the well-known cross at Dundry, near Bristol, which was a very beautiful specimen of this class of structure. He knew of another at S. Donat's, in Gloucestershire, and another at Hentland, Herefordshire. The former was a sumptuous cross, highly enriched with sculpture, and in the latter the upper portion was perfect, with the sculptured figures of the Crucifixion and the figures of St. John and the Virgin still remaining. He was inclined to support the views taken by Mr. Cutts on the subject of the restoration of these crosses, and he was happy to say he had had the opportunity of restoring several himself. At Llandaff was a sculptured churchyard cross erected by Mr. Conybeare, to the memory of his father Dean Conybeare. He quite agreed with Mr. Cutts that these crosses formed an admirable adjunct to the churchyard, and formed very pleasing objects in themselves.

Mr. Hovenden Hendry, Associate, said there seemed to have arisen some little confusion as to these churchyard crosses, which had been mentioned indifferently with village, oratory, wayside crosses, &c. These last, however, had quite a different character, and consequently bore a different form. It was not necessarily because a cross might be found in a churchyard, that it was a churchyard cross; on the contrary, ecclesiastical law, custom, and circumstances of the times demanded many; and several in the same yard exist to this day. The churchyard cross had its speciality,—was often in the Saxon time built some time before the church, for St. Willebald tells us it was the custom of the Saxon nation "To erect, not a church, but the sign of the holy cross, dedicated to God, beautifully and honourably adorned, and exhibited on high for the common use of daily prayer." There was a cross of this description at Cundale, Jarrow, &c., where no church existed before the Norman Conquest. They were erected upon several steps, and often had an altar at the bottom of the shaft, as at Mezy, France; at the head of the shaft there always was the figure of Our Saviour, crucified; usually on the reverse face, the Blessed Virgin, as at Derwen, in Denbighshire, Somersby, in Lincolnshire, &c. In later times at the foot of the image were two brackets, supporting St. John and St. Mary. The faces were turned east and west, the arms consequently stretching north and south. They could readily be discovered now-a-days by being generally on the south (there being always more graves on this) side of the church, and on the east side of the path, about half-way up to the entrance of the south porch, a most fitting position, as the eye might daily rest upon the sacred symbol, and derive reverence from its contemplation. They also had another mission to fulfil; it was the law of the church that once a year mass should be said at the churchyard cross, for the souls of all those resting in the sanctuary. From these circumstances, and in the present apathetic state of our faith, they could scarcely be revived in our times; to raise any other cross in their place would be a misapplication. We should do well, however, to restore and preserve those few that remain. But it required great skill, and greater erudition.

The other crosses that are found in churchyards are sanctuary, sepulchral, oratory, and monumental. The sanctuary crosses were four simple and sometimes low crosses, placed at the corners of all church lands, to denote their metes and bounds, as at Hexham. The well-known one at Croyland bears the inscription, "Aio hanc petram Guthlacus habet sibi metam." Three is not an uncommon number to find still remaining in Ireland, as at Clonmacnoise, on the Shannon, Carrick-on-Suir, St. Patrick's, Monasterboice, &c. We also find three at Ipsley, Margam, Penrith, &c. Single sanctuary crosses abound in the West of England, Wales, South of Scotland, &c. Perhaps one reason why they are not more numerous on the eastern coasts, may be that the people were there less loyal. Will Dowsing and his followers destroyed one of the stonying crosses, as they used to call them, in nearly every churchyard they visited. The sepulchral cross was frequently a massive Latin cross, with a small circle containing a crucifix at the intersection; such are to be met with in Ireland, and occasionally in Wales, but it appears that after the eighth century sepulchral crosses were invariably laid flat. Oratory crosses were frequently found in or near the churchyard, sometimes close to what is called the churchyard well, but is more properly speaking the village well, and frequently at the commencement of the village. In the centre of the present town of Sandbach, Cheshire, are two of these crosses together, richly sculptured with scriptural subjects, very lofty, and on raised pedestals, evidently oratory crosses of some celebrity.

There were numerous other vertical or lofty crosses, such as village (which afterwards became market) crosses, memorial, standard, wayside, penitential, battle, pillar, commemorative, and devotional. All of these have their separate and distinctive form. He (Mr. Hendry) suggested that some member should give a paper, compiled from a careful research into the history of all crosses, and their uses, both religious and secular, external and internal, from the earliest ages; and he might add, perhaps, the abuses of them in the present century.

MR. HORACE JONES, Fellow, remarked that there was one description of cross which had not been alluded to,—that was the commercial cross, a very important cross in many towns, and often a very interesting and handsome feature. Mr. Seddon would no doubt particularly recollect the one near Hereford, called the "butter cross," which was memorable from the circumstance that during the prevalence of the plague at Hereford, the country people left their butter at this spot, and the inhabitants of the town left their money there in return for it, the cross having been erected for that purpose. His memory did not enable him to enumerate all the crosses of this description which still exist, but he might mention those at Doncaster, Chichester, Salisbury, Winchester, Malmsbury, Ross, and Hereford.

The CHAIRMAN remarked that Mr. Cutts had strictly confined himself to the subject of churchyard crosses. Wayside crosses had been incidentally mentioned, and they, in conjunction with the market crosses, would form a very interesting subject for another paper; and he was sure the Institute would be delighted if Mr. Horace Jones would favour them with one.

Mr. WHICHCORD, Fellow, remarked that Mr. Cutts, in his allusion to these ancient crosses, had made use of the term Romano-Christian in connection with them. He thought the most remarkable of these crosses had not been alluded to, viz.—those in the Isle of Man. Many gentlemen present would recollect that these crosses were very ably and minutely illustrated in the first series of the Transactions of the Architectural Publication Association, about twelve years ago. The illustrations were very carefully and accurately drawn, and he could not do better than refer Mr. Cutts to those publications, as furnishing the details and illustrations of a great number of these crosses. He gathered from the remarks of the reverend gentleman that he attributed crosses of this character to a very early Christian era; he (Mr. Whichcord) was not in a position to controvert that opinion this evening, but at the same time he desired to direct the attention of the members to the crosses he had just alluded to, if in fact they could be called crosses at all. They were, for the most part, curious stones, such as Mr. Cutts had accurately described; but it occurred to him that they were of far greater antiquity than any symbols connected with the Christian religion, He believed this remark applied to the crosses at Cattewood, which presented types extremely similar to those found in the Isle of Man. If that were so, and if there was any identity in the periods at which these crosses were erected, he thought their date would prove more remote than anything connected with Christian symbols. [The CHAIRMAN remarked that he thought the crosses at Cattewood were of comparatively recent date.]

Mr. DONALDSON (Past President) thought sufficient emphasis had not been given to the crosses in Ireland, many of which were identical with some of those met with in Somersetshire and Suffolk, the ornamentation of which was, in some cases, intricate and interesting. They were obliged to the reverend gentleman for calling their attention to the monograms on these crosses, because the more complete the history of these objects was, the more complete was the instruction they conveyed. Most of the crosses which remain in this country were, he believed, of the Tudor period of our history, and some of them were very elegant, though in some cases hardly having the form of a cross, but probably were originally surmounted by a cross. With regard to the suggested revival of these crosses, he would remark that in Roman Catholic countries the figure of the cross was an object of religious veneration by the people; but in this country he considered it was unnecessary to perpetuate the churchyard cross in the present age, as a memento to the Christian mind, since, if such memento were wanting, it was furnished in the crosses which appeared on the gables and various other parts of the exterior of the church itself. He had seen crosses in Switzerland which were surmounted by an external canopy. The cross contained the representation of Our Saviour on the Tree, with the scene of Calvary below. That was no doubt the origin of the cross, which was thus not merely a symbol, but a representation of the great event of the Crucifixion. It seemed to him that, if crosses were erected in an æsthetical point of view, it would detract from those solemn feelings with which they were regarded, and by Roman Catholics especially.

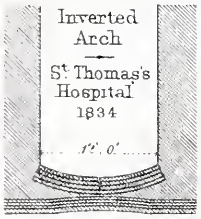
Mr. EDWIN NASH, Fellow, thought that it was scarcely correct to attribute the churchyard crosses chiefly to the Tudor period, as from his slight acquaintance with them, he believed that by far the greater number were of an earlier date. He hardly thought that in the present day they need necessarily be connected with supersitition, but their object was to mark the churchyard as a place separated from common uses. Their architectural beauty could not be disputed, and they were as a seal set upon the site, that all comers might respect it.

The vote of thanks having been passed,

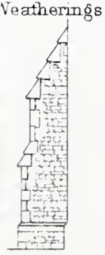
The Rev. E. L. CUTTS having acknowledged the vote of thanks, remarked that his own impression differed from that put forward by one of the speakers (Mr. Hendry), as to different forms of crosses being appropriated to different purposes. His own impression was that whether the cross were a churchyard one or for monumental or other purposes, the common type of cross of the period were indifferently used. The market cross was no doubt very interesting, and its use arose in this way. The market people used to assemble round the tall cross which stood in the market place or on the village green; and for their convenience a pent-house was erected round the cross, whose shaft formed the central pier, to form a shelter for the market people. In some cases the market cross expanded into a stone building, with a cross erected upon the upper part. [Mr. DONALDSON suggested that they might have been erected originally as receiving houses for the market dues paid to the monasteries. Mr. Cutts inclined to the opinion that they were simply intended for the purposes of the market, and grew out of the covering erected round the shaft of the cross. With regard to the period to which these crosses belonged, some which appeared to be of the eighth century might be of earlier date; on the other hand, there were some which, from their shape, appeared to be of very early date, but from the inscriptions they bore appeared to be as recent as the seventeenth century. As to the use of the crosses where several existed in one churchyard, it was to be generally inferred that some of them were sepulchral crosses; though in some cases they might have served different purposes: *e.g.*, in the case of sanctuary crosses there would be four or more, to define the limits of the ground within which sanctuary could be found.

Mr. DONALDSON remarked that many memorial crosses were met with in Roman Catholic countries, to mark the spot where any great crime of murder had been committed, or any accident had occurred resulting in death. It was usual to put up a cross in such cases.

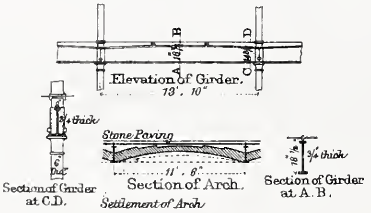
REMARKS ON FAILURES IN CONSTRUCTION
BY EDWIN NASH, ARCHITECT.



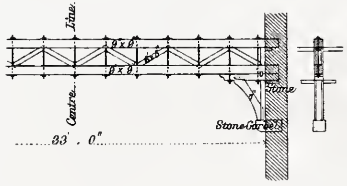
Buttress Weatherings

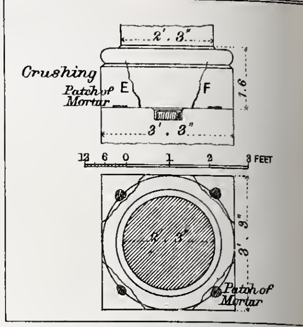


Cotton Mill at Oldham.
Fell down in 1844.

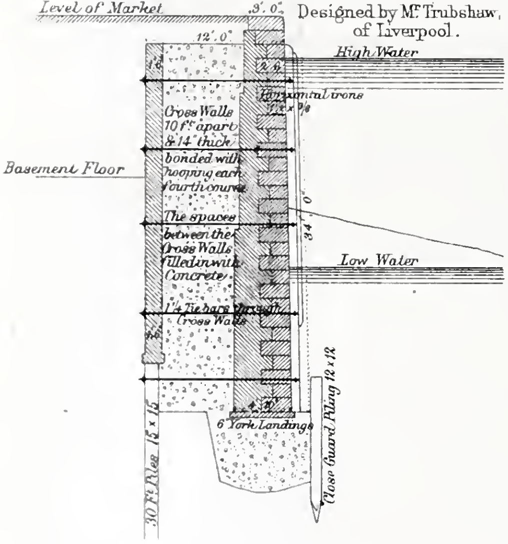


Trussed Girder.

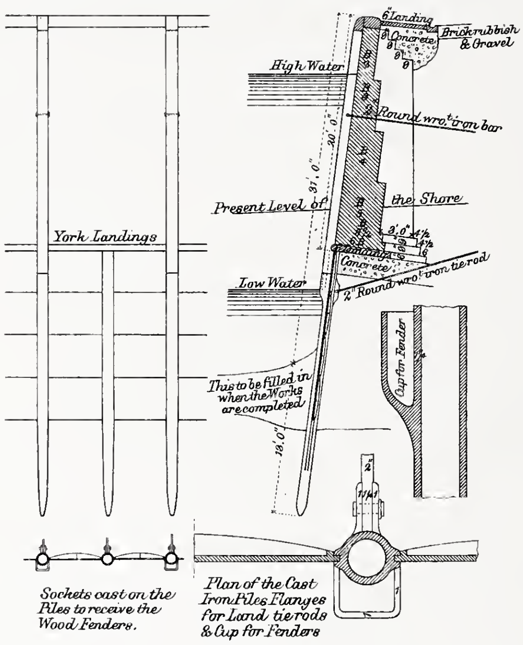




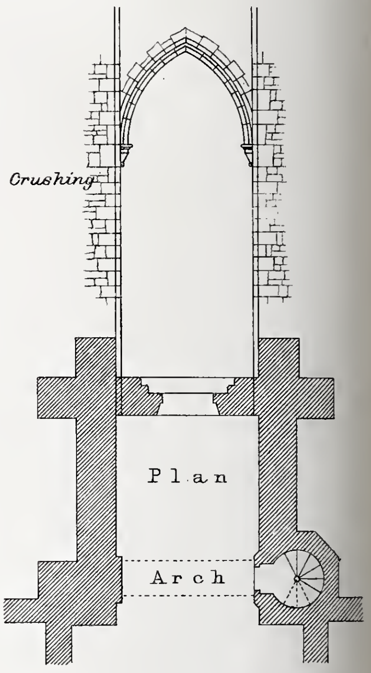
Wharf Wall Billingsgate. Erected 1849-50.
Designed by Mr. Trubshaw, of Liverpool.


Level of Market
3'. 0"
12'. 0"
High Water
Horizontal irons
Cross Walls 10 ft. apart & 14" thick bonded with hooping each fourth course
Basement Floor
The spaces between the Cross Walls filled in with Concrete
34'. 0"
Low Water
1 1/4 Tie bars through Cross Walls
6" York Landings
30 Ft. Piles 15 x 15
Close Guard Piling 12 x 12

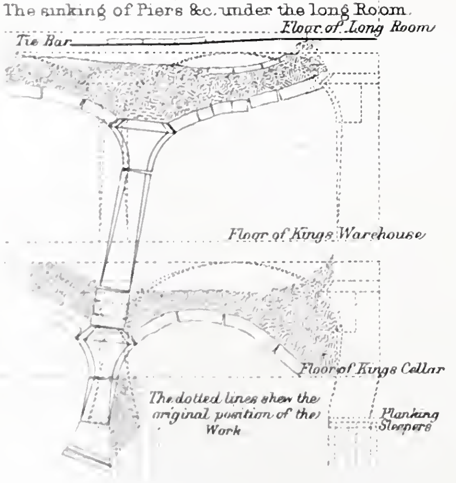
Steam Boat Quay on the Thames.
Fell down in 1843.


6" Landing
Concrete
Brick rubbish & Gravel
High Water
Round wro.t iron bar
31'. 0"
20'. 0"
Present Level of the Shore
3'. 0"
Concrete
Low Water
2" Round wro.t iron tie rod
York Landings
This to be filled in when the Works are completed
13'. 0"
Cup for Fender
Sockets cast on the Piles to receive the Wood Fenders.
Plan of the Cast Iron Piles Flanges for Land tie rods & Cup for Fenders

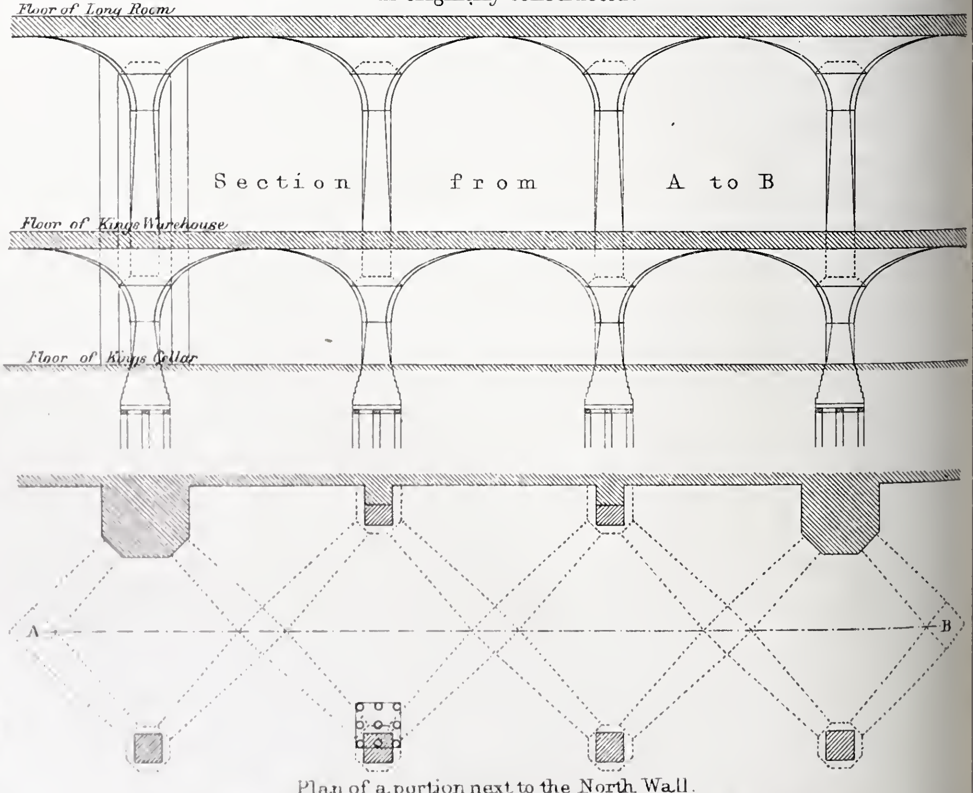
A Church Tower.



The Custom House.
The sinking of Piers &c. under the long Room.

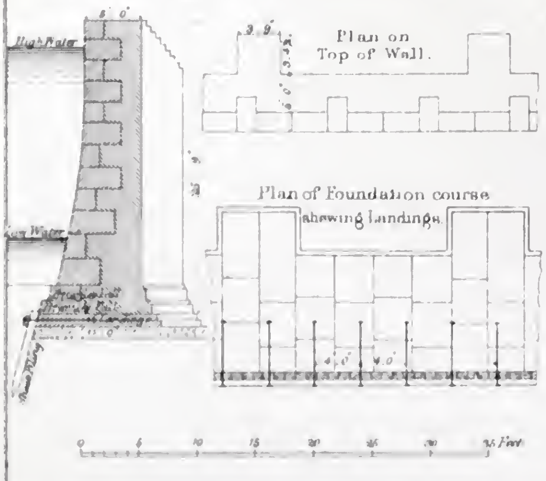


Vaulting under the long Room of the Custom House as originally constructed.



Plan of a portion next to the North Wall.
Shewing the false position of the Piles under the Pier which sunk.

Wharf Wall. Houses of Parliament.


5'. 0"
High Water
Low Water
3'. 9"
Plan on Top of Wall.
Plan of Foundation course shewing Landings.
4'. 0"
4'. 0"
0 5 10 15 20 25 30 35 Feet

Litho. for the R.I.B.A. by Kell Bros London, E.C.

REMARKS UPON FAILURES IN CONSTRUCTION.

By Edwin Nash, Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, April 8th, 1867.

> "L'objet de la construction est d'exécuter toutes les parties d'un ouvrage projeté avec toute la solidité et la perfection dont elles sont susceptibles, en y employant les matériaux les plus convenables, mis en œuvre avec art et économie."—*Rondelet*, '*L'art de Bâtir.*' *Vol.* 1., *p.* 8.

Failures in construction often teach more than successes, inasmuch as experiences, dearly bought, leave an indelible impression, and open our eyes to circumstances not before perceived; and this trite observation is exemplified when any part of a structure shews results in the stability of the materials different from those intended, and exhibits some ill consequences, be they great or small.

Failures in building operations are numerous, but I am pleased to have found that by far the great majority of them occur in structures upon which no professional architect has been engaged; nevertheless there are cases wherein skill and science seem to have been at fault; and yet this is not surprising, when we consider that architectural works are surrounded by a variety of circumstances that render an approach to perfect work almost impossible. For instance; the soils we have to build on are seldom twice alike; the materials available are seldom exactly suitable or sound; the many hands the work has to pass through are not always the best or the most trustworthy; the vicissitudes of weather are inimical, then there is the item of insufficient money—and particularly there is the undue interference of those who have to pay it, besides many other items too abundant to name.

Although I have received much kind and valuable aid from my professional brethren, it is not easy to obtain very accurate information upon failures, because, when they occur, opinions upon them are usually diverse, and, if the real cause be known, some persons are shy in revealing it, especially when it may be interpreted as shewing absence of skill, whether that be the fact or not. Imperfect information upon detail has made me reject a great number of cases which would otherwise have been good subjects for illustrating this paper, for without accuracy of detail I could not venture to estimate either the cause or the effect. Architects would do well to preserve the utmost amount of detail when failures happen, such particulars being most important aids in promoting a correct knowledge of constructive principles; and, though it is natural to be silent upon mishaps, it is not always necessary to be so. The surgeon does not suppress the knowledge obtained from an examination of disease, but publishes it for the benefit of his brethren, and though the circumstances are not parallel, yet there are occasions in which architects may beneficially exhibit their *esprit-de-corps* in a revelation of the difficulties and results of their practice, for it is often the mystery which envelopes a subject, and not the full statement of the truth, that does harm to those concerned.

Neither time nor opportunity will enable me to go fully into this large subject, and the many men of knowledge and experience who frequent this room, will see little that is important in the following remarks; yet, perhaps they will admit that some knowledge of the pitfalls that surround us on all sides, induces circumspection, and assists in the choice of such measures as contribute to the accomplishment of the grand aim of sound building.

It is not always that failures upon a large scale or at the grandest buildings are the most instructive, but many of a less important kind have often a more useful bearing upon daily practice; and I propose chiefly to look at these more ordinary items, yet, in this latter category, I must not be expected to include many of the failures in those flimsy structures, with which speculators as flimsy disfigure parts of our suburbs; for a large proportion of them are beneath criticism, and our surprise at their standing is often greater than at their fall. I might interpolate some remarks here upon those vermin of the building trade who are too much encouraged by landowners, solicitors, surveyors, and others, to the great detriment of all persons who have any respect for good building, but, it being somewhat beside the subject, I must pass on.

FOUNDATIONS.—A very large proportion of failures may be traced to imperfect foundations, and too much care and sagacity cannot be exercised by the architect in arranging his underworks, keeping in view the principle that uniformity of bottom is of far more importance than anything else. We may imagine that he may build upon wool sacks if the whole be of that nature, and it is possible to build well upon a uniform bed of peat by carefully spreading the weight over the whole surface, and many structures have been so built, and, as respects London, most of the houses in the neighbourhood of Finsbury Square and Circus, stand on a somewhat peaty bed, and the site of the beautiful mansion erected in 1816 for the London Literary Institution had a bed of that sort. If the whole of that building had been founded upon the undisturbed surface of the peat, instead of cutting through it for the main external walls only, as was done, there would probably have been few or perhaps none of those irregular settlements which were occasioned by some subsidence of the internal walls, from the drying up of the peat a long time after the building had been erected, and which rendered underpinning needful. I do not mean to say that soft bottoms are to be coveted, but, on the contrary, I should like every architect to revel in the luxury of a hard one, such as chalk, which is about the best soil that can be had, very much on account of the homogeneity of its nature.

When adding to old buildings it is often necessary to allow parts of old foundations to remain, and to build new work upon them; and though it is bad in practice, and has been sometimes attended with bad results, it cannot always be avoided. The settlement of new work built against old work is commonly understood, and the settlement is very wisely allowed to go on with as little check as possible, so that it may not drag upon the old; yet in those cases in which one has to build not merely against, but amongst and upon old work, there is a danger of irregular settlements, and perhaps of fractures, or something worse: instances of this might be given, and they suggest the great desirability of making a complete rooting up of the old work, so as to have a clear site for making a fresh and uniform bottom for the whole of the new portion.

CUSTOM HOUSE.—The astonishing falling down of the Long Room at the Custom House, in 1825, was a remarkable illustration of these points. It was not occasioned by defective design or workmanship in the building itself, but by defective arrangements in preparing the foundation. The site was a confused mass of irregular old walls, sewers, ancient quays, and rubbish, the *debris* of numerous works that had been formed there in successive ages. It was through and amongst this chaos that a foundation of wood piles was unwisely driven, and it is therefore not to wondered at that untoward mistakes and irregularities occurred, whereas if all rubbish and incumbrances had been cleared away (at great cost perhaps), there would have been a free field for operating upon with certainty; the absence of this precaution, and in fact, the working so much in the dark, was the cause of an imperfect foundation, and especially of a small mistake at one part, that occasioned the failure of one pier, which brought on the fall of many piers, and the destruction of the greater portion of this large and costly edifice. The building had two stories of vaults formed with a very extensive series of stone and granite piers carrying brick arches, and each pier stood (or was intended to stand) upon nine whole-timber piles, forming a square, covered with planking. Some of these piles did not drive properly into the ground in consequence of the unseen obstructions they met with, and the entire site being incommoded with vast heaps of rubbish it was no easy task to get all set out and executed in accurate position. This was particularly proved in respect of one of the piers, under which the middle row of the set of piles belonging to that pier, was mistaken for the outer row, and the square group got thus planted on one side, and it becoming afterwards obscured by the loose rubbish placed around it, the stone pier when built in its right place did not coincide with the wrong place of the piles, in short, half of the pier had no foundation whatever, but hung over the mere rubbish, while the other half just balanced upon the edge of the group of piles, and although a considerable time elapsed before this pier fell, yet when it did slip off the piles it had nothing but soft uncompacted rubbish to receive it, and consequently it went down to the astounding degree of five or six feet, burying itself to its neck, and urged downwards by the extra pressure given by the other piers and arches above, which, having lost their equilibrium, sank over towards this descending pier, and the two stories of vaults eventually fell as a disastrous ruin. The important law suit, The "Crown *versus* Peto," arose out of this unhappy affair. I may add that, whatever may have been the architect's opinion as to a suitable foundation for this building, the piled foundation was no part of his own scheme, and was not included in the builder's contract, but that it was the mode advised by another of high authority and reputation.

The ancient practice of a plentiful use of concrete had not then been fully revived, though this immediately followed; and it was even extensively used at the reparation of the Custom House itself, and since then wherever there has been a site of analogous character, concrete has been used as a complete bed all over, in fact, concrete bottoms have now become universal, and in the present day at the new St. Thomas's Hospital, the architect proposes to make a general clearance, and to cover the entire surface with a very deep bed of that compact material. At Fishmonger's Hall there was not only the concrete but a complete frame of timber running through all the footings.

VARIETY OF HEIGHT.—Variety of height often causes irregular settlements, and it is commonly seen that lofty towers when engaged in the body of a building, sink down to a greater degree than the less weighty parts, and thus damage the connection of the work. This may be seen in the engaged Tower of St. Martin's Church, at Trafalgar Square, where the work around has been broken by the extra pressure; and there are numerous instances of the like result. This circumstance indicates not only the necessity of particular hardness and spread in the foundations of towers, but also the desirability of not engaging them too much in the body of the building, and it is noticeable that Sir Christopher Wren (although some of his buildings shew the defect now alluded to) was fond of keeping his towers distinct from the general mass, an arrangement which, as a general rule, is also æsthetically preferable. Indeed it seems to point out that each particular height and weight requires a corresponding difference in the strength of the foundation, and that the higher parts should be erected proportionately in advance of the lower parts, yet much refinement in this respect would cause complication, and might defeat the end in view.

WATER IN FOUNDATIONS.—Water in foundations is a fertile source of injury to buildings, and often brings them down; and where they do not fall it causes bad settlements. The examples are more frequent than is perhaps imagined, but only a few instances of falling down from this cause need be named. In 1856 four new houses at Paddington. In 1860 a house in Clerkenwell. In 1861 a bridge on the Great Northern Railway. In 1862 the piers of a viaduct on the Hammersmith Railway, killing six men, where water from a ditch seems to have saturated the bottom of one only of the piers. In 1865 a railway bridge at Beckenham by flooding. In 1866 houses at Penge from saturation. As to the irregular settlements caused by water, it may be observed that within the clayey districts of the metropolitan area, they readily occur, the soil being peculiarly unfit for saturation, as it thus becomes sodden and almost liquid; indeed, it does not well bear changes of any kind, inasmuch as it shrinks and swells almost as certainly as the barometric fluid, and there are very few houses in the suburbs without some crack that might be traced to the imperfections of the soil they stand upon. Depth is the great thing in this clayey soil; it is more important than breadth, because depth gives a greater removal from the influence of the weather and from other disturbances, such as the formation of a deep sewer in the neighbourhood of a building after it has been some time erected, the sewer having the effect of drawing moisture out of a very extensive area, thus allowing the soil to shrink, and the stability of a house to become disturbed. In all cases where there is any possibility of rain or other water accumulating in the bottom during the process of building, it is important to have the drains laid and in action before commencing to build. Clay, if perfectly quiet, is not a bad soil to build on; but if weather or springs affect it underneath a building it is almost as bad as sand affected by similar process. The blue clay under London is a very compact body; but the yellow clay is not so reliable, and there being alternations of gravel and sand with the clay it is sometimes found that water drawn from newly sunk wells has the effect of drawing out particles of earth from these looser strata, which consequently subside and permanently injure the buildings that stand above. An enumeration of irregular settlements in London would form too long a catalogue.

Quay on the Thames.—I will now refer to a Steamboat Quay on the Thames, the front retaining wall of which fell down in 1843, after it had been six years in use, and it gave symptoms of its dissolution long before the catastrophe. The outer part of the broad gravelled quay, artificially formed upon the foreshore of the river, appeared to be on the move previous to any signs of failure in the river wall, and I noticed this disturbance on several occasions without then having the least idea of what was about to happen. Now, if we turn to the section, we shall see how the work was planned: observe the level of low water,—it is at least 3 ft. 6 in. below the bottom of the retaining front wall; but this seems to have been thought of no consequence, inasmuch as the work below the footings of that wall was a breastwork of iron piles at short intervals, and iron face-plates closely fitted together, and tied in by long land ties, and backed by concrete, thus holding in the artificial foundation or embankment upon which the wall was to stand. The concrete extended up to the base of the wall, but, as most of it got washed away bodily during its deposition, it was replaced by washed gravel, with two feet of concrete above it, underneath the wall, which was started upon a footing of six-inch York landings, with the front edge of them resting on the head of the iron piles, and this particular circumstance will want further notice presently. The wall then went up as on the section, being five bricks thick at bottom, and three bricks thick at high water level, all in cement, and well bonded with iron hooping, and there were counterforts at intervals, and tie rods midway held in the timber guard piles that were socketted into the head of each alternate iron pile, the piles being about five feet apart in the clear. Now, how came this to fall down? In the first place there was no coffer-dam, and the concrete could have had no proper protection from the water of the river, and consequently could not very readily harden. Moreover, the wall ought to have commenced under low water line, instead of above it, for the bed of the river having been lowered to the line on the drawing to allow steam boats to lie close up to the dummies, or barges, at all times of tide, the water flowed freely over the two upper ranges of iron face-plates for a height of about eight feet, half of which being above low water, was subject to the change of being wet and dry daily: now, supposing any imperfections, however slight, in the joints of that part of the work not covered by the shore at which water could enter, there would be a daily entrance and daily discharge of some quantity of water below the base of the wall, and if it did find any degree of entrance anywhere it would at last reach the embankment behind, enforced by the pressure of from sixteen to eighteen feet height of water, added to which there would be the drawing effect of a rapidly falling tide; and this insidious agency of water in constant action, perhaps slight at first, would, in time, carry away a portion of the earthwork of the embankment below and behind the brick wall, and this at an increasing ratio; and all this appears to have occurred, assisted perhaps by land water from behind, which would aid the running out of particles of earth when the tide was down. The broad roadway or quay surface (as I have said) first became irregular, and then slowly shrunk downwards, and after a time the wall tended inwards, and did not appear to go down bodily like the embankment itself; and this must have been because its front edge was firmly lodged on the top of the iron piles, which, going into the ground a long way below the disturbance we have been noticing, held more firmly to their place, and caused the wall to tilt over inwards. The whole of the middle portion of the quay went to pieces as a complete wreck, but the rounded ends, which had been piled with three rows of wood piles within the outer iron piles, stood firm.

I think the case not only illustrates the danger of letting a foundation have any chance of disturbance by water, but it also particularly shows how injudicious it is to let a foundation stand upon two kinds of support. This wharf wall should have been either wholly of brick from bottom to top, or wholly of iron from bottom to top, like the iron and concrete walls at Fresh Wharf, by London Bridge, and at Brunswick Wharf, Blackwall, and like some others wholly of iron.

I must add to these remarks that the engineer disapproved at the time, of the omission of a coffer dam, which would have made it possible to carry out his original design in a proper manner, but, as it belonged to a joint-stock company, its members thought this requirement of the engineer was needlessly expensive, and over-ruled him.

As a contrast to the above I will just point to a section of the wharf wall at the Houses of Parliament, where the work goes down a good distance below low water line, and has no kind of irregular support at the bottom, and consequently no likelihood of failure. Another good wall is that of Billingsgate Wharf; the only questionable part (if it was carried out as per section) being the second or internal wall, which is shown as standing on the heads of piles, which, though a good foundation for the wall itself, might, from its being tied to the front wall, which has no piles, have occasioned a little difference in their settlement, though no effect of the kind is observable in the structure.

PILES.—Let me reiterate a remark often made respecting wooden piles, namely, that if durability be essential, they must be far removed from atmospheric changes, and then, in such circumstances, the timber may even become fossilized after sufficient lapse of time; but I am unable to perceive the suitability of pile foundations for any part of London, except the river margin, though they seem to have been very common during the last century, and instances are constantly occurring in which buildings of that era show severe cracks, and require underpinning, when it is found that the irregular sinking has been occasioned by the decay of timber. The drawing out, instead of the cutting off of piles used for dams, is a well-known imperfection in practice.

RAPID BUILDING.—Rapid building is a well-known cause of failure; and many disasters arise from it, particularly during the more humid portions of the year, and if the fragile houses that are run up round London did not get some rest on Sunday, the crooked, overhanging, and falling walls would be even more numerous than they are. But even some well-built structures have failed through haste, and several of modern date might be mentioned. Excessive care is needful with foundations, when it is necessary to build rapidly, besides those other precautions that are common in respect of quick setting material, and plentiful bond, &c.

INVERTS.—Inverted arches are of great value for spreading weights if they be properly applied, but they have been known to fail from the radius being too great in proportion to the width. I will name one at the buildings of St. Thomas's Hospital, at London Bridge, erected in 1834, and recently taken down. The opening was about 12 feet, and the drop of the arch about 15 inches; its extrados was just above the footings, and its skew backs were in the main end wall of the four-storied ward buildings, no brickwork being above the intrados, and soon after the roof was on the arch broke in the middle and showed a disposition to spring upwards, but no evil result occurred. The spread of bearing in this case would have been better obtained by a wide extent of footings, and no invert, and I am of opinion that flat inverts under very distant piers, such as the columns of a church, are not only useless but are really dangerous. Inverts should in many cases be bricked up in the solid of a wall, and, if that cannot be done, it will be better to have large, wide spreading, and deep bases and footings. In the few churches that I have built I have never put an invert to any column, and I remember that in 1844 I heard Professor Hosking at King's College express similar views to these, and yet it is singular that the same authority, only two years previous to that date, published what may be called a recommendation of shallow inverted arches between the piers of large bridges; but this suggestion has surely never been made use of, it being quite unsuitable for any bridges but those of small span.

CRUSHING.—Crushing of material is a subject that necessarily comes much under the architect's observation.

In 1848 the columns of a new church were formed of chalk; this was, of course, the grey chalk, which is a sound homogeneous material, and if kept dry will sustain a good weight, but in this case wet got to it and some frost, and it went to pieces. There is a beautiful modern church at Weybridge, in Surrey, with chalk columns carrying the nave arcades, and when I saw it a few years ago all was in an excellent state; yet it seems to me that when we look at the adverse conditions to which building operations are exposed, it is scarcely wise to use so absorbent and so light a material for bearing purposes. Some kinds of chalk are not unfit for other uses in a building, and a good application of it for ornamental work may be seen in the late restoration of St. Cross Church, at Winchester.

In the case of a Bath stone column in a modern building, from which sprang four large arches, it failed from crushing, or rather it was from breakage. The shaft was a cylinder of 2 feet 3 inches in diameter upon a base 3 feet 3 inches square, and it was the moulded base stone that broke. The weight on the column was about 68 tons, that being 17 tons per square foot, which is less than one-third of the smallest weight that is sufficient for crushing according to experiments, which have shown that it takes at least 54 tons per square foot to crush good Bath stone. The discovery of the failure was made soon after the building had been roofed in, and all was in very perilous condition, inasmuch as if this shaft had come down nearly the whole building would have followed. The stone that broke was the one used at the ceremony of what is called laying the first stone. It was 1 foot 6 inches thick, and 3 feet 3 inches square, and in the centre of the stone beneath it was a small hollow for a bottle of coins, so that there was no bearing in the immediate heart of the work; but the failure was not caused by this, but by the improper manner in which the stone was bedded by a noble personage, or rather I should say by the masons who prepared the bedding for his lordship. The foreman thought he must have the mortar peculiarly smooth and good looking, which was an error to begin with; he then put four stout patches of it on the lower stone, one near each of the four corners, where it got somewhat dry during the time consumed by the ceremonial; and after that time some fine liquid mortar, very much like grout, was put over the general surface, and his lordship trowelled it about, but the four patches were not flattened down nor made homogeneous with the other mortar, yet the stone was then lowered, leaving the four patches as the most solid portions. All stood well for nearly a twelvemonth, until the entire weight came on, and then a crack was observed at E on drawing, another followed at F, and another at each of the corresponding portions of the square. The alarm being given all had to be shored up, the broken stone removed with much difficulty and new put in, and, after getting out the shattered stone, the four patches of mortar were still distinctly visible, and were evidently the cause of the failure, for you will perceive that none of them came under the periphery of the shaft, and, as those points bore the weight, there was in fact no general bed, and the stone had not sufficient strength to carry the building upon four legs as it had been doing. The lesson to be learnt from this is, first, that the ceremonial foundation stone should never be one that has to do a great amount of duty, because at such ceremonies the workmen are apt to be bewildered, and to perform the work in a way that looks more pleasing than solid, and secondly, that fine mortar and thin joints are not so good as more hearty material and stouter bed, and thirdly, that when a circular column stands on a square stone it is well to have the joint at the four corners of the square sawn out a little, to relieve the horns which might break off, or so to alter the form as to make this needless.

Much might be added under the head of crushing in respect of careless or unskilful masonry in freestone, which is often made too good looking to be good at heart, although a fair face is not to be despised. The bed and the bond of the stone is seldom thoroughly what it ought to be, and when these are neglected a soft stone bearing a great weight is apt very readily to show its distress. Squareness of bed (I do not mean smoothness) is an essential quality in freestone masonry, for if the bed be tapering, and wedged up to bring the face to its proper place, no dependance can be put upon such work; the outer edges, too, should be slightly eased off, instead of being worked close to make an extremely fine joint; but there is no space here for minute masonic details.

There is abundant evidence in both ancient and modern works of the defective mode in which the materials of walls are put together, and though this may be of comparatively slight importance when the walls have not much duty beyond that of being the enclosures of buildings, yet when they have to sustain great weights or thrusts it becomes of paramount importance that their materials be well applied and united, and this fact seems scarcely to have been fully appreciated since the best days of the Greeks and Romans. The crushing of the piers carrying the dome of the Pantheon at Paris is a most instructive warning under this head, and, while deploring the occurrence, we cannot but admire the remarkable mechanical talent displayed by Rondelet in the restoration of them, and the book that was published on the subject is well worthy of study, but the chief defect that I wish to allude to is the absence of that uniformity in the horizontal strata of walls which the word homogeneous most expressively indicates, and of which defect the tambour wall under the dome of St. Peter at Rome is a notable example. In a rapid age like the present it is not likely that this homogeneity or similarity of material through the whole thickness of the wall will be thoroughly attended to. I will note a small matter that is slightly connected with the point, namely, that in buildings even of considerable excellence the water tables of buttresses often break away from the body of the buttress, especially when the bulk of the work is of rough stone, as in the sketch; this irregular settlement shows that the dressed stone, being more compactly laid than the rough stone, the two do not harmoniously blend, and that a more thorough bonding is needful, by using longer alternate stones than is customary, and it also suggests the idea that buttresses may have too great a projection, inasmuch as the outer part may not catch the due influence of the weight.

The power of materials to resist crushing can only be ascertained by experiment, but in all experiments the results have been so various that we must take care to use the safe side of the results. We have heard of 40 tons and even greater pressure being put upon a stock brick of special quality, but these extreme cases must not be allowed to mislead us. A trustworthy experimentalist, Mr. Thomas Cubitt, stated 13 tons as being about the power of a stock brick to resist crushing, which is far more likely; but my belief is that something like 12 tons per superficial foot of brickwork, not per brick, is the greatest weight permissible in ordinary practice.

Some valuable experiments were made on Bath stone in 1864 by Messrs. Poole & Son, for our Fellow, Mr. Pearson, and the results were, I believe, circulated amongst our members, for which information we ought to be grateful. The crushing weight upon a foot super of bed varied from 185 tons to 54 tons; and what was called the first damage appeared with weights varying from 103 tons to 46 tons. Detailed calculations of weights and bearing power are not often needed in the usual building operations, but to neglect them altogether is a most dangerous habit. I will here state my belief that a large number of building stones, especially those of the calcareous kind, have a greater bearing power when their natural bed is placed perpendicularly than when it is placed horizontally; nevertheless it will not do to use them in that manner in parts that are subject to atmospheric influences, which is perhaps almost tantamount to saying that they should not be used so at all.

TOWER STAIRS.—One of the points connected with crushing is the position of the stairs in church towers, for when one side of the tower is open to the interior of the church it is important so to place its staircase that the tower shall not be improperly weakened by the hollow space which the stairs occasion. In a lofty tower that was built according to the plan shown, you will observe that one side is open to the church, and here there was a lofty arch, springing at 24 feet above the church floor. On the side next the stairs a crushing commenced, and alarmingly increased after the roof was on, but the whole was saved by immediately bricking up the stairs solidly from bottom to top, showing that greater bulk was needed in that part. The stairs ought to have been put at one of the outer angles of the tower, or have been kept much further out from the inside of the wall.

STONE STAIRS.—It may appear to be strange to state, and yet is is a fact, that it is not very uncommon to see solid stone stairs, with open well hole and exposed soffit, put up with each step merely lapped over the other and pinned into wall at one end. Architects well know that this is seldom enough for such stairs, but that to be safe, each step must be notched upon the one below it, and that they often fail when otherwise executed. It is all-important with stairs of this kind that the bottom step stand on a thoroughly firm foundation, and that the lower front edge and the upper back edge of each step be well notched the one to the other; the best form of notch when the steps are triangular, being that with which you are all familiar, but for rectangles a square notch is preferable. Stairs are very strong when thus properly notched, but many faulty stairs exist even in good buildings from insufficient attention to the point. I suppose that what I state should be vouched for by an instance, therefore let me name the Railway Station at Sydenham, where the stone steps were not notched, and where they got out of place, but, being observed in time, a queer remedy was applied by putting timber beams under them, and wood strings housed on, with wood rail and balusters, instead of the former of iron, and to the lower portion a wall was built under the ends.

The stairs of the Shire Hall, Chelmsford, fell in 1856, breaking off, and leaving the ends in the wall; that accident was attributed to the landing failing first, yet this could scarcely have occurred if proper construction had been attended to. It is quite as necessary for the landing as for the steps to be notched on, and the landings should be joggled together, and in many cases it is wise to put an iron beam, but never a wooden one on account of its shrinkage, which, however slight, would slack the bearing.

In Professor Lewis's most valuable paper on fire-proof materials and construction, read in this room in 1865, there is an account of the fall of stone stairs during a fire, from the rush of cold water upon heated stone, which was evidently the case; but as the detail of the construction of the steps is not fully stated, and as wood landings which did not fall down are named, I may be permitted to entertain some doubt as to the notching of those stairs, and as to the junction of the upper steps with the wood landings, for I am of opinion that open stone stairs should never finish against wood landings unless there be also an independent and unshrinking support for the upper step, such as a stone or iron bearer, for it must be evident that, if all is to be firm, it must be as impossible for the top step, as for the bottom one, to slip in the slightest degree, the top fixing being the very keystone of the system.

As I have alluded to joggles, let me name certain law proceedings that took place in 1844, relative to a large extent of landings at Westminster Cemetery, when very contradictory evidence was given as to what a joggle is; and as it is important that architects should agree in the names of things, I will observe that the only true joggle is that in which a groove midway along the edge of one stone, receives a corresponding projection worked along the edge of another stone. The double groove joint, whether it has a plug, or be only run with lead or cement, is not a joggle.

CORNICES.—Enormous cornices to buildings should not be used unless there be an easy mode of giving them a natural balance:—any mode of tying down a cornice, which, without tying down, would topple over, is vicious in the extreme. There have been many instances in which large cornices have failed to keep their place. One near Vauxhall Bridge, fell in 1851, and killed several men. One in the New Road, in 1854, with severe injuries to workmen. One in Wood Street, Cheapside, in 1855, killing one man. In 1856 one man was killed and others were injured by a fall of cornice from the Wellington Barracks near Buckingham Gate. In 1865 a cornice in Winchester Street.

BRICK FLOOR ARCHES.—A very large number of failures have occurred in brick arches used to form fire-proof floors, and in very many instances the fall has arisen from injury by rain or frost, when they have been turned during a wet period of the year; such was the case with those of the prison at Northleach, which fell in November, 1844; with those of houses in Bloomsbury, which fell in January, 1850; with those of the Liverpool Corn Exchange in 1852, and the fall of the latter appears to have been accelerated by some sleeper walls, for flooring, being built upon the arches longitudinally instead of transversely; but the main cause is stated to have been saturation by rain, and the injudicious removal of the centerings, while the mortar remained unset: another mishap of like kind occurred with floor arches in Victoria Street, Westminster, in January, 1853.

It is well known that arches of this and other kinds frequently fail, from the centering being struck too early, and sometimes from the centering being too flimsily constructed. Amongst mishaps from this cause may be named the arches over Brixton Waterworks, which fell in 1855, killing several men—a bridge near Darlington, in 1856—a bridge on the Forest of Dean Railway, which fell in 1861.

FIRE-PROOF FLOORS.—As to fire-proof floors, as they are called, when formed of iron bearers and brick arches, they have been almost conclusively shewn to be not fire-proof by Professor Lewis, in his admirable paper before mentioned; and he clearly explains that brick piers as well as brick arches are necessary, if fire-proof work is to be accomplished, nevertheless iron and brick floors have been, and are still so much used, that it will be interesting to make a few remarks on the ironwork connected with them.

CAST IRON BEAMS.—Besides the falling of the cast iron roof of the Brunswick Theatre in 1828, killing eighty persons, there have been other startling accidents from the breakage of cast iron beams carrying floors; such as the fall of a factory at Salford, in 1824, killing eighteen persons; but the destruction of twenty persons by the fall of a Cotton Mill at Oldham, in 1844, raised an alarm as to the general safety of cast iron beams, which were then in very extensive use for bearing purposes, and it became the turning point in favour of wrought iron for heavy weights or wide bearings.

It was Mr. Thomas Cubitt, who, with great ability, when reporting on this case, urged that attempts should be made to use wrought in place of cast iron; his idea was that of rolled iron beams—the boiler-plate beams, now so universal, having then scarcely come into use for buildings, and only to a moderate extent for ships.

Ten years after this date, Mr. Fairburn published his book on the application of cast and wrought iron, and in it he advocated a greater use of wrought in place of cast, and remarked that "for some time after 1844 we had little or no knowledge of the superior resisting powers of wrought iron in the shape of beams."

The Oldham Mill was one of several floors on the fire-proof principle, with cast iron columns and cast iron girders, carrying brick arches; a part of the upper floor fell, and caused the floors below it to fall also, so that the whole suddenly became a ruin. The evidence went to shew that the beams were slight,—that their section was not good,—that the tie rods which united them, were placed too high up, and moreover that some of the castings were removed from the sand while red hot, and this last defect, was, no doubt, a most serious one; and it is surprising that any manufacturer should do this, although it effects a saving to him, for it is not necessary to be an ironfounder to perceive the folly of suddenly cooling any hard material, be it iron, glass, or pottery, in which, and such like materials, it has from time immemorial been known that an annealing process is absolutely needful if toughness instead of brittleness is to be obtained; yet, while architects are subject to the neglects of manufacturers, how perilous is their position, the only protection, and that a very imperfect one, being the testing system, by which some little, and only a little, security is gained, it being impossible to apply a severe test without doing injury to the beam. I believe it would be well for architects to stipulate not only the proving force to be applied to each girder, but also the number of hours that are to elapse between the time of moulding and the time of removing from the mould, though it may be difficult to ensure the observance of the stipulation. The smallest things should remain in the sand, say 12 hours, and larger castings double, or treble that, or longer, to suit the case.

It will be seen by the drawing that the section of the Oldham beam was not of the form most approved in the present day for strength, namely, the wide inverted **I** of a certain proportion, its bottom flange was not wide enough, and the metal was not of equal thickness all over, a point which is important during the period of cooling, in order that crystalisation may go on at an equal speed in all parts.

A few out of the many other instances of failure in cast iron beams may be named. The Caledonian Distillery, at Edinburgh, in 1857, where four stories with fire-proof floors in course of erection suddenly fell down. A fire-proof floor to a building at Wolverhampton, where the girders were **A** shaped, tied by rods, and carrying brick arches and stone paving. The evidence was that the girders were too weak, and were badly made, having cold-shuts in them. A Sugar Refinery at Leith, a heavy structure of eight stories, and entirely of iron and brick, fell in 1865, killing four persons and injuring others; but it seemed probable that the foundation yielded in this instance, and so strained the iron work. An iron and brick floor of the Chartered Gas Company's Works, at Westminster, in 1865.

Boiler-Plate Girders.—I believe it possible to put too much faith in the boiler-plate girders now in vogue, for it is doubtful whether all the joints and all the rivets do their duty; and moreover, if the rivets be subjected to jar, they may in certain positions fail, as in some railway bridges. Nevertheless a more valuable invention has never been acquired, and we see the great capabilities of it in that monstrosity near London Bridge, which, in an æsthetic aspect, degrades the age in which we live.

I believe the fact is not very generally entertained that wrought iron subjected to continuous concussion becomes crystalline, and proportionately loses its toughness. I have had no practical experience of this, but it is a not unimportant phenomenon, and should be understood. Looking at it theoretically it might be expected that any substance, whose nature it is to be crystalline, would endeavour to return to its natural condition out of the unnatural state that it has been made to assume by artificial operations, such as those that have been brought to bear in the manufacture of wrought iron, whereby a fibrous structure has been enforced, and that the encouraging process of shaking by continuous concussion may assist the going back to the normal crystalline habit of the material. There seems, also, to be some connexion of this phenomenon with the polarization of iron by concussion. At all events, as there does appear to be some possibility of wrought iron losing a portion of its toughness after it has been used in construction, the item of possible failure becomes thus introduced.

WOOD BEAMS.—The breaking down of beams in wood floors has sometimes occurred, and we had a serious instance of this in 1865, when a school floor at Westminster fell during a fête, killing two persons and injuring ninety more. The bearing of the beam that broke was stated to be 20 feet, and its scantling 13 inches square, and the distance from the next beam 8 feet. It was of Baltic fir.

From these data we gather that the area of floor appertaining to the beam was nearly 182 feet, thus, at 160 lbs. per foot (a full allowance) and adding the weight of the timber, the whole weight to be borne was 31,325 lbs., and taking this, with the given length and depth of the beam, let us see what the breadth should have been for carrying this weight without destroying the resilience, using the recognised formula:—

$$\frac{L \times W}{510 \times D^2} = B \qquad \frac{\overset{\text{Feet.}}{20} \times \overset{\text{lbs.}}{31,325}}{510 \times 13^2} = 7\tfrac{1}{4} \text{ inches.}$$

therefore, supposing the beam to be die square and not cut into, the breadth of $7\frac{1}{4}$ inches would have been suitable for the load; but it was 13 inches broad, and the morticing for the joists certainly could not have weakened it to the extent of the difference: in fact, the beam was larger than required by the rule for stiffness, yet the beam broke, and the evidence of those who were called in to inspect seems to have been that the timber was somewhat poor and knotty, and had been heated and dried by gas jets underneath it, whereby its tenacity had become lessened. Now we observe no circumstance that may not occur any day in any building; and it is really a sort of accident not easily guarded against. If the timber had been found to be rotten inside it would have been a good illustration of the advisability of cutting whole timber in half, turning it inside out, and bolting it together, by which means you see better what you are about though you get a more expensive beam, and one that is not stronger. Confidence in formulæ becomes a little shaken by these occurrences, not in their theoretical accuracy, but in their practical applicability.

FLITCH GIRDERS.—Flitch girders will bear a remark or two. Cast iron flitches have, I suppose, been nearly discontinued; yet I know of a warehouse in the City in which they have recently been used, and where one of the number failed, although it had not so great a weight upon it as the others that remained sound. But, whether the flitches be cast or wrought, the proper theory to be observed in constructing these beams is, to treat the wood as the bearing material, and the iron as an assistant only to the wood; they cannot both be masters. Then, admitting this, what must be done? If you make the iron and the wood of equal depth, all three pieces of material bear upon the wall, which is contrary to the above principle, and moreover, it has this bad effect, namely, that after the girder has been some time in the building the wood is likely to shrink, and to become of less depth than the iron, with the sure result that all the bearing must be thrown upon the edge of the iron flitch, however slight the shrinkage of the wood, and however tightly the iron may be bound to the wood, and the iron is likely thus to become distressed and perhaps to break, and perhaps to crack the template on which it bears. It seems, then, that the flitch should always be of less depth than the wood by, say an inch, and if the sides of the flitch could be roughed so as to have a surface like the teeth of a very coarse file, the adhesion to the timber would be improved. I, however, consider that even the simplest complex beams, such as these, have their disadvantages; the bolts seldom keep thoroughly up to their work, and the flitch may be always on the move, according to the temperature, and therefore may not comfortably dwell within its wooden bands, and I have no doubt that if old flitch girders were examined many would be found to be very like three independent girders, side by side, rather than like one solidly bound and uniformly acting mass.

SUSPENSION GIRDERS.—Girders trussed, on the suspension principle, are sometimes used; one at a Flour Mill, at Shadwell, failed from the suspension rod having square-wormed screws, the thread having been stripped off by the weight, which most likely would not have happened if the thread had been of the pyramidal form, which is very far stronger for resisting tensile force.

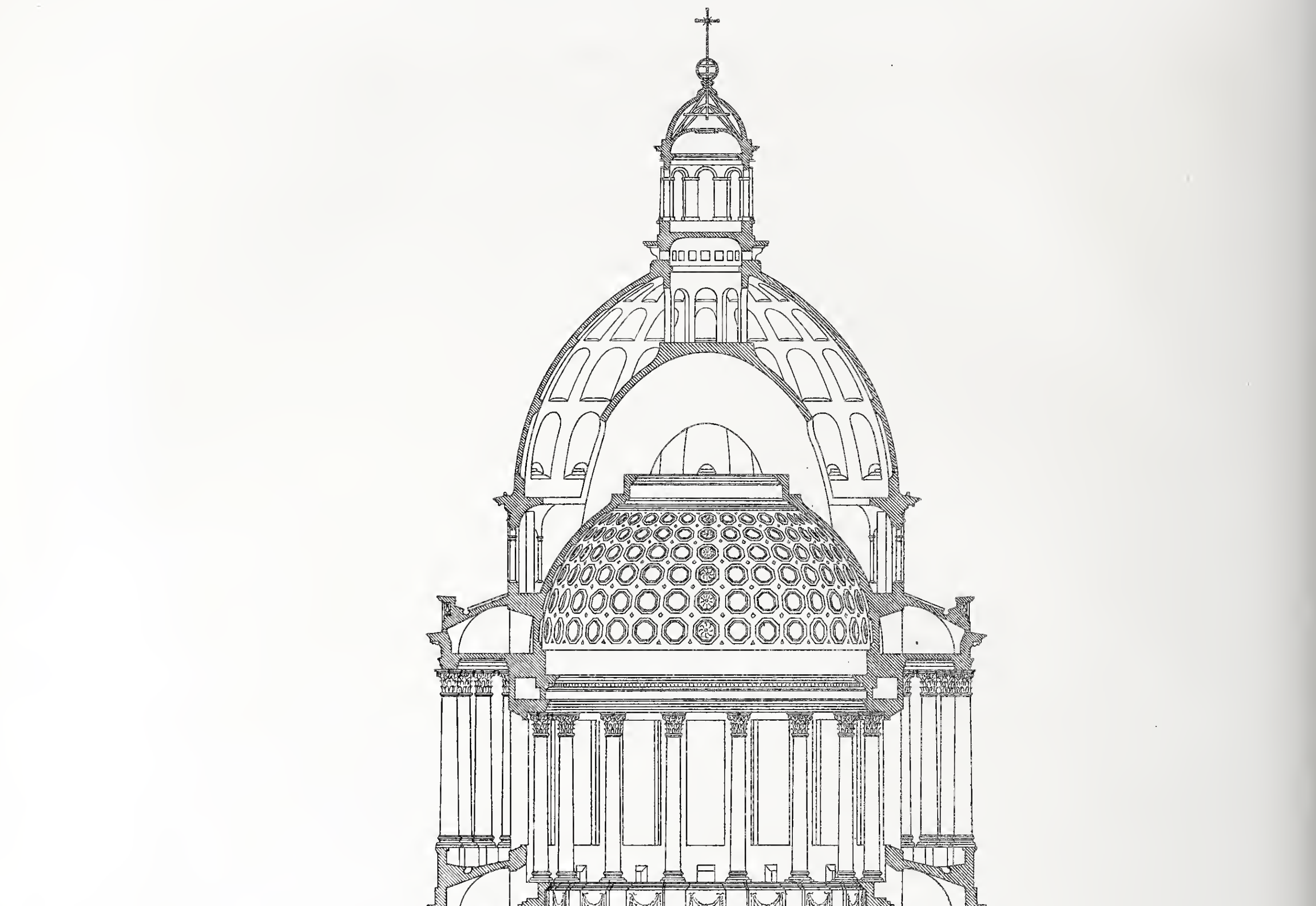
HARD WOOD.—The combination of hard wood, such as oak, with soft wood, such as fir, is often needful for making good work, there being cases in which the ends of timbers, acting against the sides of other timbers are apt unduly to compress and indent the parallel fibres, whereby a truss may become crippled: it is common to interpose a piece of metal, but this is not always what is wanted; for instance, the trussed girder in the diagram was executed wholly in fir, and it settled more than was agreeable, and it ought to have had the head of the wall bracket of oak, there being very considerable pressure upon the point of the diagonal, where the ends of the fibres might indent themselves into so soft a wood as fir. The heads and cills to wood posts in warehouses should be of oak, as they sometimes become too much compressed when of fir.

BREASTSUMMERS.—Perhaps it is needless to allude to the insufficient manner in which breastsummers are frequently carried to support the fronts of many houses, because the fact is evident to every one here. Yet builders of the common sort are so reckless in this respect, that it is painful to observe their confidence, and we ought to check the folly if we can: they seem to think that their brick fronts are airy things, and that if the breastsummer touches a few inches on the wall at each end, all must be right. A corner house, open on both sides for a shop, is a most perilous looking thing, as commonly constructed, and I imagine that, when many of these buildings become a little aged, they will give ready evidence of their deficiency in ligature and muscle.

The principle in this paper being to illustrate by facts, I must quote one instance out of very many. In 1863 two houses fell at Penge and killed two men, the fall being occasioned by the weakness and bad fixing of the breastsummers, combined with wet foundations and rapid building.

CHIMNEY STALKS.—Chimney stalks for factories require some care. It is important that they should stand independently of the surrounding buildings, both on account of their greater weight, and on account of there being always some degree of rock in them from the force of the wind, whereby it might happen (as indeed has happened) that a process of jerking against other brickwork may eventually bring the stalk down. It is also desirable that they should be built during the summer season. Several stalks have fallen soon after being erected. This was so with one at the Counterslip Sugar Works at Bristol in 1849, at Joynson's Paper Works, at St. Mary Cray, several years ago, and at many other places, and generally from careless design or bad workmanship, both of which are quite inadmissible in such tall structures. Good authorities have stated that their height should never be more than ten or twelve times the width of base above ground, and the top not wider than two-thirds of the said base, and you will not find that this gives a very sturdy proportion. Of course, near the bottom there should be a good spread, and a general form, something like that of the Eddystone Lighthouse, would be far preferable to many of the shapes that are seen, such as the absurd one of a great undercut torus, intended as an attempt to make a chimney look like a Doric column. Depth of foundation is, in these buildings, particularly needful, and the fire-proof lining must never be considered as part of the structure.

Chimnies that have got out of the upright have sometimes been got back to the perpendicular by very clever treatment. There is one now standing near the canal, between London and New Cross, which leaned over soon after it was built, but was got back to its place by boring holes in the mortar joints near the base on the contrary side to the lean, and, being done with much caution, it gradually assumed its perpendicularity. Another, and large one, in Yorkshire, which had a very great lean and



SECTION OF S^T GENIVIÈVE, PARIS.

French 10 5 0 10 20 30 40 50 60 70 80 90 100 Feet
English 10 5 0 10 20 30 40 50 60 70 80 90 100 Feet

Litho. for the R.I.B.A. by Kell Bro^s London E.C.

was likely to fall, had part of a course of bricks cut out from the bottom, slowly and carefully, and filling in the cavity, as the operation went on, with new lime and earth, and, when the cut was thus complete, the chimney gradually lost its lean, squeezing out the lime and earth as it came over. Other cases might be cited, but the above suffice.

UNDERPINNING.—Underpinning is really an important subject under the head of Failures; and when we see that accidents under this head may cause verdicts of manslaughter to be recorded against architects, as was the case against Mr. Abraham, after the noted fall of a house in the Strand, in 1853, we must be awakened to the necessity of so arranging the business part of such operations that the architect shall not be made responsible for details he cannot control. It is often a sort of work that requires intelligent watching during every moment of its progress—and this is not the architect's business; and if this view be not recognised by courts of law, it behoves us to define the responsibility in a written document between architect and builder before commencing the work. A very good letter on the subject was written by Professor Kerr at the time of that accident.

The underpinning of lofty and ponderous buildings by the aid of gigantic shoring is not only too large a subject for this paper, but it has been too ably treated of by others to need remarks now. The works of Rondelet, at the church of St. Geneviève, at Paris, and of Flachet, at Bayeux Cathedral, are notable examples, besides the works at Hereford, Chichester, and other buildings, of which no publication has yet been made. The underpinning at the Custom House was also an extraordinary work.

FALL OF OLD BUILDINGS.—The fall of old buildings scarcely comes within the scope of this paper, because the failure often arises from the mere decay of age, yet sometimes it may have been from an original defect in the structure, and that defect, if it becomes revealed to us by the fall, teaches us something. The records of failures in the middle ages, rather indulge in religious than in practical explanations of the causes, and so we do not gain much practical knowledge from these examples, such as the fall of the towers of Winchester Cathedral, in the twelfth century; of Gloucester Cathedral, in 1160; of Worcester Cathedral, in 1175; of Evesham, in 1215; of Dunstable Priory, in 1221; the smaller towers of Worcester Cathedral, in 1222; the tower of Lincoln, in 1244; of Ely Cathedral, in 1322; of Norwich Cathedral, in 1361; and the west front of Hereford Cathedral, in 1786, and the central tower would have fallen had not its impending ruin been observed and remedied a few years ago. The old tower of Thurston Church, Suffolk, fell in 1860. Then we have the Chichester tower in 1861. The above small list of towers awakens the thought that special care is needed for all structures that are carried upon piers, instead of upon continuous walls. But the description that has been clearly given by Professor Willis, and by Mr. Burnell and others, of the cause of failure in the Chichester tower would, I imagine, have been very applicable to many of the other cases. The lesson derived from the Chichester fall seems to be, that rubble masonry should never be used in piers carrying towers or other heavy work; it is a masonry suitable where bulk and weight are main objects, but it is inadmissible where unyielding vigour of pier is to be attained; it also suggests that in any such case a soft kind of stone is scarcely safe, even if it be of a sound nature; and the stone forming the facing at Chichester, though in some respects a good stone, was not suitable for a position where a crushing force was the chief force in action. It was from near Binstead, in the Isle of Wight, and it is (I am pretty sure) the only tertiary building stone in England; but if we want a thoroughly good freestone, we must get it out of the secondary beds.

The stone in the piers of the French Pantheon was of rather weak quality, but I am uncertain as to whether the *pierre d'Arcueil* and the *pierre de Mont Souris* with which they are built, are secondary or tertiary stone, but that with which the inner and intermediate domes were formed was tertiary, from the quarries of Conflans, about eighteen miles from Paris, and for which latter purpose it is particularly suitable. This stone has recently been used in England at a new house erected in Kent for an eminent geologist.*

Having now consumed enough of your time upon somewhat ordinary items, I trust that some discussion will ensue, for I have not touched upon a tenth part of the subject, and my opinions upon those points which I have noticed may be controverted. It is easier to find out faults than to originate any excellent thing, and it is far more grateful to praise than to blame, nevertheless, the statistics of failures should not be disregarded, although unpleasant in a certain sense, for I deem the value of the enquiry to be great, and particularly useful to young practitioners, from the check that it gives to undue confidence, from the wide view that it opens to a practical mind—from the exactness of thought that it induces—from the increased certainty that it gives to building operations, and from the honour that accrues to the profession by the enduring results of science and skill.

A vote of thanks was passed to Mr. Nash for his paper, the discussion on which was reserved for a future occasion.

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* No more than a passing allusion has been made here to the constructive failure in the piers of St. Geneviève (a section of which building is appended to this paper), for the subject is too important to admit of any but a lengthy description. Rondelet's work, 'Sur la Restauration des Piliers du Dôme du Panthéon,' should be consulted on this interesting point.

ON PEDANTRY IN ARCHITECTURE.

By JOSEPH BOULT, Fellow,

Read at the Ordinary General Meeting of the Royal Institute of British Architects, April 29th, 1867,
T. HAYTER LEWIS, Vice-President, in the Chair.

THE fluctuations which architectural style has undergone since the decline of Pointed architecture naturally challenges the attention of those who desire to reduce the practice of art or science to definite principles. During the last fifty years these changes have been so numerous and rapid as to throw much doubt over the problem; and it is excusable if some should suppose it is impossible to define any principle for the practice of architecture, and believe it must ever remain the creature of caprice, a toy of fashion.

Were it correct to define architecture as the art of building refined "by identically the same process by which cookery is refined into gastronomy, or tailoring into an art without a name," I should not attempt to engage your attention with the following observations; but I venture to entertain a different conclusion, although that quoted is propounded by a writer, to whom more than to any other, the profession is indebted for a careful resumance of all the known styles.

The practice of architecture being composite, *i.e.*, scientific and artistic; utilitarian and æsthetic; constructive and decorative; the aspect which it presents to each observer will vary according to the proportions in which those elements are combined in the work itself, and also in the observer's mind; thus, the permutations, to borrow a mathematical expression, are infinite; for the observers are innumerable, and the conditions prescribed for each work are illimitable in variety. The observer who is most susceptible to utilitarian, scientific, constructive, and decorative elements may, perhaps, be excused if he does not perceive that the emotions of awe, reverence, devotion, tenderness, peace and others, are just as much akin to architecture as they are to sculpture and painting. The uncultivated mind is rarely prepared to appreciate compositions in sculpture, painting, or music, as the artist would wish; and at least as much cultivation is requisite for the proper appreciation of architecture.

On the other hand, I believe, the tailor and the cook are quite unable to excite those emotions, except in their lowest and most sensuous forms; analogous to the effects of physical development. The adjectives "sublime," "beautiful," "magnificent," applied to a horse, a dog, an *entrée*, or a robe, apart from personal association, have very different significance when applied to painting, sculpture, or music; and I think it will be generally conceded that, when applied to architecture, they indicate effects, more analogous to the latter than to the former. If they are, how is it that the fluctuations of style in painting, sculpture, and music are so much less arbitrary than they have been in architecture? Though there have been great changes in the practice of the three former arts, they resemble natural growth, or development analogous to those changes in architecture, through which the Perpendicular style was developed from the Roman; but recent changes in architectural style have been much more arbitrary.

It might be interesting, but scarcely desirable to speculate upon the history of architecture subsequent to the perfection of the Perpendicular style, if the revival of letters, the discovery of printing, and the Reformation had not taken place. If the works of Vitruvius had remained undiscovered, or, if their study had been restricted to the place in which they were deposited, the architects of James I. would probably have left memorials very different from those which now record their taste and skill; but, as it was, they were induced to emulate the glories of Rome, as far as they could free themselves from the influences and habits of workmanship which they inherited. And so with each succeeding generation, who, in turn, have attempted to engraft upon architecture, as they found it, some style or form, which it had assumed in other climes or ages, instead of applying, under the conditions of their own times, the principles from which the styles they admired sprang. So completely have those principles been ignored, that constructive features lost their original significance, and were introduced for decoration only. This practice is not yet eradicated; and it may be doubted whether it is likely to be removed by highly moral reprobation; or, whether the more judicious and efficacious remedy will not be found in a recurrence to the principles of architecture, leaving the architect, *qua* architect, to the same moral and religious influences, as those which govern his brother in the practice of law, medicine, or trade.

In attempting to enunciate some of the true principles of architecture, I may not hope to advance opinions which, being correct, shall also be new to this Institute, composed, as it is, of gentlemen who have enjoyed the best opportunities of study and practice; but, when principle and practice are widely at variance, I believe it is very beneficial to revise the latter by recurrence to the former, and the remarks now submitted may elicit observations, confirmative or corrective, from those who are competent to guide.

The utilitarian principles of architecture, those which it shares with civil engineering, and "the art of building," are two-fold, namely, the principles of arrangement and those of construction. There is a purpose in every erection. If simply monumental, it records a person or event; but usually it ministers to some necessity, convenience, or luxury—sometimes it is both ministerial and monumental. When ministerial, its functions may be altogether external, as in a bridge; but usually they are internal: sometimes they are both. Whether monumental or ministerial the erection ought to be perfect of its kind (speaking of course in the abstract), otherwise we must suppose it is built for a purpose which is not to be realized; if it be both ministerial and monumental, then the more important function should have preponderance; and usually the ministerial is to be preferred, if the proprietor's wish is paramount; but sometimes it happens that the architect and the proprietor do not altogether agree upon this. In cases of doubt, however, I submit that the decision of the proprietor should be final and conclusive, for I apprehend if the architect provided the funds he would wish to have them expended on the objects which appear to him most desirable.

Observation, however, shows that it is often extremely difficult for an architect to surrender his æsthetical or ideal preferences, when opposed to the practical purpose of the building. Of all the grounds of dissatisfaction alleged against the profession this preference for effect over utility is, perhaps, the most frequent and apt. This may in part arise from greater capacity in people generally for appreciating arrangement; but it is to be feared that professional practice affords occasion for the charge, as, usually the imaginative is more attractive to an artist than the utilitarian.

One or two illustrations may render more clear the opinion I wish to convey, and they shall be taken from the management and distribution of daylight, which has been so influential in distinguishing the various styles of architecture.

It is well known that Liverpool is the great market for the staple of our cotton factories; but it may not be known how very important it is that the apartments in which that article is vended should be free from shadow or shade, yet without glare: the light must be full and equable throughout all the business hours. To secure freedom from glare, the sample rooms, in which transactions of that kind take place, are lighted from the east or north; generally, I think, the preference is given to a due north light; if not due north, a light from the north-east is preferable: other aspects will have direct sunlight at some hour of the day; but in an eastern aspect the morning sun may have passed off before business is commenced; in a western, it may come on before business is concluded.

It is also important to avoid cross lights, and therefore corner rooms, having windows in two aspects are undesirable; and it is also undesirable for the light to be introduced through two planes in one opening. It sometimes happens that in courts, or wells, windows have been constructed to project before the upper story, and the top made sloping and glazed, because the vertical light thus obtained is stronger than that through an ordinary vertical window. Now, if the light be admitted through the top and side of such projecting windows, it is asserted that the effect is an inequality of the light, which is detrimental to the sample of cotton; the combined lights of each plane are to some extent cross lights, and injure the sample. Other precautions must be adopted to prevent glare; the reflection from glazed *white* tiles, whitewashed walls, bright red, or even cream-coloured bricks, opposite windows, and other objects, is often totally destructive of an otherwise well placed sample room.

A "cotton light" must also be free from shadow or shade. I believe a broker's ideal window is one which is entirely free from any opaque substance in the whole length of his counter; and as his counter may be forty or fifty feet long, he gives his architect rather a hard nut to crack, for he still expects to have his floors maintained in their true position, and the whole fabric substantial, if not elegant. This, however, being the ideal, the architect is expected to attenuate his masonry to the utmost, and to abjure reveals. The principal in a large sugar bakery affirms that iron and glass are the only suitable materials for the construction of sample room walls, and it is not clear he would not consider that columns four inches in diameter cause excessive opacity.

Various attempts have been made to realize the broker's ideal style; but those architects who have most nearly approached it have scarcely attained elegance, though the palm for *lightness* perhaps may be awarded to them, so far as the mere glass is concerned. Examples of this style are usually put away into courts and other back places, as though the authors were somewhat ashamed of the result, however successful the broker may proclaim them to be. Here, then, is a problem which has yet to be solved, to clothe this rude skeleton framework with refinement, beauty, or grandeur. Is it to be confessed that the architectural talent of the day and country is unequal to a task, in which they cannot draw any aid from the practice of former days?

To prevent misconception it should, perhaps, be stated that a broker desires that from a few inches above his counter to the ceiling, the external enclosure should be all glass; and that anything in the nature of Gothic tracery is to be most carefully eschewed, as it would intercept all the most vertical rays of light, which are those which are most valuable to the broker, who requires an unbroken stream as brilliant and uniform as can be obtained, combined with perfect freedom from glare.

In the exhibition of works of art, especially of paintings, the management of light is of the highest importance; in studios and in the cabinets of picture dealers much ingenuity is sometimes exercised to secure the best light the apartment affords. The most successful exhibition of paintings I ever saw was at a civic entertainment, where the pictures were ranged all on "the line" or near it; a tier of gas jets were fixed just above the head of the spectators, between them and the paintings, and the eyes were protected by an opaque screen; thus, a brilliant light was thrown upon the pictures. This arrangement combined the advantages of a top and side light without the defects of either, for there was not any "raking," and, the spectator being in shade, the light flung upon the picture illuminated every part in perfection. I have been told that West's studio was designed on this principle. This and other examples illustrate the best mode of distributing natural and artificial light in galleries for pictures and sculpture, and from them may be drawn the requisite instructions. Place the light high; let it fall on the picture from the front, not sideways, and place the spectator in shade, or, at any rate, in half light. The aching head and eyes, which so often accompany a prolonged visit to an exhibition, are surely evidences of the necessity for some relief from the unmitigated glare of light, and gold, and colour; and that relief might be agreeably obtained, and strained observation refreshed, could the eyes wander over the other spectators under a half light. Some slight approach to this is obtained in the Gallery of the Artists in Water Colours, in Pall Mall East; a less transparent veil would, I believe, improve the light on the walls, and afford more relief to the spectators, but would be injurious to the works on the screens. Much admiration has been expressed for the Picture Galleries in the Great Exhibition of 1862, which were a successful experiment; but there was very little contrivance in the management of the light, beyond the introduction of veils and blinds, and these do not belong to the structure —they partake of the nature of accessories and palliatives, the too frequent adoption of which would almost justify the analogy between an architect and a tailor. In designing a gallery the architect, I apprehend, should avoid rendering these devices necessary. Pictures, like cotton, require a strong, equable light, free from shadow or shade, and without glare, combining the advantages of top and side lights. In cotton, the light must be near the sample, in order that the fibre may be examined; in pictures, the distance seems immaterial, if only the light be strong. Where the roof is wholly transparent, as when of clear glass, the reduction of light is, of course, very trivial, whatever the height; but where the roof is partially opaque great judgment is required in proportioning the height to the area of transparence. There appears to me to be great scope for architectural ingenuity in designing a gallery, which shall display the pictures to the greatest advantage, and at the same time be an example of architectural art. Hitherto picture galleries have been modelled upon throne rooms, banqueting halls, and other state apartments, hung with pictures instead of paper hangings or tapestry. In the early revival of the arts this was not an unnatural defect, for probably there was not any large apartment erected exclusively for the reception and exhibition of pictures. The study of the apartments in which pictures have been placed, aided by the experience of artists and picture dealers, should enable an architect to provide for the future that precedent the past does not afford. I believe that originality in architecture will be most certainly secured by an earnest desire faithfully to meet the modern requirements of the building, rather than by uncertain experiments in *bizarre* effects, or by the painful repetition of effects derived from earlier productions. It is an honourable ambition, when properly controlled, which makes an architect desirous of giving to his work a monumental character; but observation shows that buildings purely ministerial have become monumental through the longevity due to perfect adaptation of purpose, while others, designed to be monumental, have been destroyed as "cumberers of the ground," because they were monumental, and nothing more.

Passing to the constructive and scientific, it appears to me that architectural style has been, and should be much influenced by the nature of the materials used, by the practical skill of the workman, and by the scientific knowledge of the architect, and, over all, by climatic requirements.

The latter have been to a considerable extent modified by the discovery of new, or by the improved manipulations of old material; still, however, they do exist, and their claims challenge consideration. Take, for example, a large main cornice in any of our populous smokey towns. If this be slightly weathered on its upper surface down to the top of the corona, the soot and dirt which are deposited thereon in fair weather form an inky solution in the next shower, and, trickling down the moulded face, quickly destroy, not only the delicate relief of the carver, but the more defined shadows of the mason. If the cornice be boldly weathered, and a small drip be formed between the edge of the weathering and the mouldings, the latter are preserved from the defilement to which those of the former example were subjected. This result is partly due to the fact that there is less deposit upon the bold weathering than upon the flat, but chiefly to the drip; therefore it appears that, under similar circumstances, a drip should be introduced, and if it is, the general profile of the cornice is altered. So likewise of all strings and other horizontal features.

In modern masonry the specific character of the material is being gradually ignored; it is frequently treated as wood, so much so that young masons, unless carefully watched, will mitre their joints, especially in mouldings, just as joiners do. To any one who prefers the masonic appearance of masonry the effect is most unpleasing.

This deterioration appears due to the fact that, whilst architects have adopted styles in which blocks of stone of small or moderate size were used, the master mason has found it less costly to use large blocks, and to chisel on the face of the work imitation joints, just as a joiner would do if he were required to execute in wood similar constructive appearances. The process being initiated, the downward progress would gradually increase, until it has attained the stage noticed above. It is justifiable to speak of this as a downward progress, because the mode of putting woodwork together must vary from masonry as much as the materials wood and stone differ. The nails, screws, glue, tongues, dovetails, braces, and the like, which are available in joiners' work, cannot be adopted in ordinary masonry. If the use of large blocks of stone is desirable through the high price of labour, then I submit the style of the building should be adapted to the condition imposed. At present the results of masonic joinery are extremely objectionable. For example, in the curved head of an opening the principle of arch construction is usually entirely neglected; sometimes the whole is worked out of one stone, the voussoirs being marked, perhaps channelled on the exposed faces, as though they were decorative features instead of constructive requirements. The head in this case is simply a huge lintel, very much weakened by the material removed in forming the curved opening, and the pseudo voussoirs, instead of yielding strength and stability, are a further source of weakness, as the false joints or channels are so much "sawing," by which the breaking of the stone is facilitated and the lines of fracture determined. Sometimes this vicious treatment is carried so far as to introduce a very prominently developed keystone, upon which is carved a very bold and elaborate truss, which, of course, is so much additional weight of material thrust upon the lintel at its very weakest point; that is, on the middle of the bearing, and where the greatest quantity of stone has been cut away vertically. I am not now dealing with the propriety of sham decoration as a matter of deception, legitimate or otherwise; my wish is to direct attention to a very faulty mode of construction which in various ways is acquiring adoption, and to suggest for consideration whether the resumption of correct principles of construction would not assist in assimilating the practice of the profession into one style; which may, indeed, include several schools, but may be also a mother tongue, not only to architects and artificers, but to the general public also.

As a rule it will be admitted that in masonry each block of stone should have an uniform bed, that it should not rest upon a point, and that joggles or dowels should be introduced more for the purpose of security during the progress of erection, and whilst the work is green, than as essential to its permanent stability. In the semi-circular head of an opening constructed in three stones we often see the whole of these axioms of construction set at nought.

Observing how much the use of sham material and of sham workmanship has injured architectural art, I am disposed to recommend as a sound maxim in architectural practice the apostolic injunction, "to provide things honest in the sight of all men," not because they are honest, but because, being honest, they would render necessary a treatment more independent of what has been done before. Were this a condition present in the mind of every architect and of every architectural critic, it would tend to sweep away many injurious usages and artifices, which have gradually grown over really good art, and deprived it of much of its force of character. This is greatly the result of circumstances, and he would be a bold man, especially if an architect, who should censure indiscriminately those who practise as they have been trained. Architecture is so extremely esoteric to the general public they can be found to give but little expression of interest and approval to modern works; in more ancient productions, cathedrals, churches, castles, halls, and other remains they appear to feel, certainly express, a warmer interest. In some degree they feel this warmer interest in modern buildings which resemble the ancient, provided that the ministerial purpose has not been sacrificed to the architectural effect; but if, say in a church, the congregation suffer from imperfect acoustics, ventilation, or other defects, which they consider the progress of modern science should prevent, the æsthetic gratification is greatly impaired. On the other hand, architectural works which do not aim at the realization of any cognate style have met with much approval, because they are adapted to and express the purpose for which they were erected, and there is not apparent any sacrifice of the ministerial to a quasi-monumental purpose. It would appear, then, that there is a disposition beyond the limits of the profession to admire architectural works, provided they be something more than specimens of size or elegance, light and shade, or of architecture as known to the ancients. The English mind is vastly too practical to spend money, as to go to war, for an idea, and if it is desired to win its admiration and sympathy, the architect must first sympathise with its requirements. An amanuensis may have great command of language, enriched with the choicest metaphors, but all will be vain and useless if his letter do not convey the information or sympathy for which it is dictated; and the architect is an amanuensis in stone; he has first of all to embody the ministerial intentions of those for whom he acts, and afterwards to clothe their intentions in the most correct or poetical forms his imagination can devise, his skill express.

If the opinions thus enunciated are correct, then it may be expected that edifices, the style of which has been imported, will not be very satisfactory as ministerial agents, and especially if the models from which the style is derived were designed for very different purposes, and yet the type they embody be adhered to with scholastic industry. The phrase "scholastic industry" must not be taken as conveying a sneer, or as intending to imply the impossibility of attaining freedom and elegance of expression. Collegiate experience in the study of the classics presents, in phonetic language, examples of freedom and elegance of expression in the verses and themes which are prepared by students in Greek and Latin; but still, it will be generally admitted, that it is very undesirable for the poets and orators of England to embody their thoughts and eloquence in either Latin or Greek, that is, if they wish to be understood. Indeed, the tendency of opinion in the present day is rather to regard even quotations in those languages as pedantic affectations, offensive to good taste, than to award the approval of liberal scholarship. With however much freedom and elegance, therefore, an architect may be able to express himself in an exotic style, or a dead language, it is to be apprehended that his work will be unacceptable on two grounds; firstly, that the style is unsuitable for the purpose to which it is applied; secondly, that the bulk of the spectators, that is, the general public, will not be educated sufficiently to appreciate the scholarly training or the originality of the artist. What is good will be considered as belonging exclusively to the style, and copied; what is bad will be attributed exclusively to the architect and deemed original.

If these remarks be applied to the adoption of the Grecian style, it is probable they will meet with very general concurrence, and the illustrations afforded by St. Pancras Church, and by the Law Courts, in the Castle of Chester and in St. George's Hall, Liverpool, will be admitted to be very apt. Our knowledge of the Grecian style, at any rate our practice, being founded almost exclusively upon the examples embodied in the remains of temples, the student is debarred from knowing whether the great masters in that style used it with more freedom than is permitted by the ordinances prescribed for its modern practice; and it is unknown how it was adapted to the purposes of every-day life. It is impossible to withhold from the architect of St. George's Hall the meed of thorough acquaintance with the style he used, and of using it with an elegance and freedom unsurpassed in modern times. Yet it is equally impossible not to perceive that he was, after all, very like the successful classical student, who has composed the finest prize poem his college or his university ever produced.

After making allowance for the one grand conception, which, with an enthusiasm perhaps excusable in one so young, overmastered his sense of responsibility to those by whom he was employed, it is impossible not to perceive that his work is too monumental, that the purpose has been sacrificed for effect. I do not desire to draw any comparison which may appear invidious towards one who is unable to defend or explain; but whether we look to the forensic or to the musical purpose of this building, there is a painful sense of inferiority to subsequent works by architects still living; and, like the awful Nemesis which waits on infidelity, the huge organ fatally destroys the long-drawn vista, to secure which so much was sacrificed. Where Elmes and Harrison have failed, what man is there who may hope to succeed?

There are doubtless many who will accept the examples submitted to your consideration, and will readily acquiesce in consigning the Grecian style to the limbo of all exorcised spirits, forgetting that there is or ought to be some general principle to govern the selection, and modifications of any style which may be selected; and, though all styles may not be equally exotic, all may be equally esoteric, and consequently unsuitable for modern use in this country. Those who will readily concur in abandoning the Grecian style will very likely maintain with great assiduity the perfect fitness of some form of *Renaissance* or of Pointed architecture. Perhaps one or two examples may throw a little doubt upon the perfect consistency between that rejection and this adoption. Taking the Venetian *Renaissance*, one important feature is the subordination of the ground story and the prominence of a story above; this variation being due to the fact that Venice was a city of canals, therefore the ground story was very undesirable for the principal apartments, which consequently were placed upstairs. Under similar circumstances, that is, in a city of canals, or wherever the ground story is unsuitable for the principal apartments, a like arrangement may and probably will be adopted with, *pro tanto*, similar results; but when there is not any variation from ordinary custom, and the principal apartments are in the ground story, it is allowable to marvel if the architect should adhere to the mere external of the Venetian style, the *literæ scriptæ*, and give the greater prominence to that upper story in which the principal apartments are not. There are examples in this country where the ground story, containing the principal apartments, has the aspect of a basement; the first story, with the secondary apartments, looks like a mezzanine; while the second story and attics are embraced in one stage externally to emulate *le grande étage* of a Venetian palace. Sometimes the architect, to avoid this very great inconsistency, has appropriated his ground story to secondary apartments, retaining the external appearance of a basement story; and, surrendering the mezzanine, has placed the principal apartments immediately over. This arrangement, like the former, has the disadvantage of cramping the principal entrance and giving it an ignoble appearance, except where it is elevated upon a terrace or on external stairs; in any case the inmates can never enter or quit the house, even for a quiet stroll in the grounds, without having to encounter a multiplicity of internal or external stairs. Under this aspect the Venetian style assumes an inapplicability which may perhaps excuse a little scepticism on its adaptation to the requirements of this age and country.

A strong preference is sometimes expressed for the style which prevailed in this country in the thirteenth century, and it has been proposed that modern practice should revert to that date and start anew. If it is necessary to adopt any former stage as the starting point for a new career this has the advantage over the Grecian or Venetian styles, in greater proximity of date and identity of clime; but still the variations in the state of civilization, and in materials and workmanship, would render such a reversion, if generally adopted, a very painful anachronism. The principal difficulty, however, is to be found in the multiplicity of architects, and the total absence of any authority by whom the profession can be restrained from freedom of choice and practice. Instead of speculating upon the best style for revival, either as a new starting point, or for adoption as the normal type from which deviations are not to be allowed beyond certain undefined limits, is it not better to adopt the position, chaotic though it be, of architecture as it is, and to trust for extrication to the influence of correct principles? The problem will thus be reduced to two simple parts; first, the elucidation of correct principles of design, and second, the judicious application of those principles. At present there is considerable resemblance between the position of architecture and that of a ship entangled amidst unknown shoals; and, as the experienced pilot will carefully consider his bearings, and then, by chart and compass, boldly follow the course which will bring him to the desired haven, so the profession have to consider where they are, and carefully follow thence whithersoever the principles of art may lead. Thus, and thus only, shall we escape the difficulties which beset this transitional period, and gradually evolve from the confused assemblage of many styles that form of expression which shall convey the conception of the architect to the sympathetic appreciation of an understanding public. Our confusion of tongues is as the meeting of many waters which, leaving their natural channels, surge backwards or forwards in obedience to every breath of caprice; our extrication from that confusion will be attained, not by the re-separation of every stream,—they return not on their course; but by boldly proceeding beyond the transitory surge, whither the deeper waters are as an azure lake serene.

The discovery of principle is analytical; the reduction to practice synthetical. Adopting this axiom literally, the practice of art will be to a great extent eclectic; and the architect will select, whencesoever he may see them, those forms which most fitly apply to the purpose of his work, in subordination to the principles of art. Accepting this deduction in its widest interpretation, it is permissible to combine any material, any form of construction, any ornamental detail, which is appropriate. The artist painter has all pigments in his studio, he selects those which most appropriately express his meaning. The literary man has the words of all languages in his dictionaries; he selects those which most appropriately express his meaning, modifying their forms to suit the people for whom he writes. The architect has the elements of all styles in his portfolio, he should select those which most appropriately express his meaning, modified to suit the conditions of climate, construction and purpose.

No doubt this conclusion, thus broadly and unreservedly expressed, will appear to many very heterodox, and utterly inimical to all purity of style. But what constitutes purity of style? Is the style adopted, for example, in St. Paul's Cathedral, to be considered pure? This building is, in fact, two edifices ingeniously combined so as to appear like one; but if the attempt which has been made in this paper to elucidate the principles of architecture is successful, then this combination is not in accordance with those principles; and the edifice, as a whole, is not pure architecture; and if the architecture is impure, it is impossible for the style to be pure. This may sound very presumptuous; but I venture to submit that it is not in any way amenable to that censure. In clothing his artistic interior, and his grand constructive science in the forms he adopted, Wren used the architectural dialect of the day; the defects are the defects of the period in which he lived; the excellences are his own. But, apart from the discordance necessarily resulting from combining two edifices in one, and without adopting the sweeping opinion that it is impossible for any *renaissant* work to be pure, it may be permitted to hint that the details are not so pure as if they had been modelled upon the study of Grecian, rather than upon that of Roman work. Other predilections apart, I think it will generally be conceded that the architects of Athens were more elegant and refined than those of Rome: and that it is by elegance and refinement that purity of style is to be distinguished from that pedantic scholarship with which it is frequently confounded. It is well, no doubt, that the student be versed in the best of the cognate styles; and that his proficiency be tested in the preparation of prize designs, as the student of literature is exercised in prize poems; and for the like reasons, that he may be facile and elegant in expression, and may enrich his work with those classical allusions which mark the scholar, and give pleasure to scholarly men. Avoiding a profuse display of learning, the tenor of his compositions must be English, and to the manner born, if he would be understood by the bulk of those for whom the result of his study is practically intended.

The ultimate tribunal by which the meed of success is awarded is public opinion; if any are dissatisfied with its judgment, they must wait patiently until it is better informed; if they would assist towards that improvement, the first step is to make the subject so interesting that it will attract more attention than hitherto; and to attain this result architects must design in a style as easy of comprehension as the language of the poets, otherwise they must be content to receive only the homage of pedants, and the rewards that homage may afford.

This painful pedantry by which some architectural works have been distinguished justify the application of Bishop Hall's satire on some of the literary men of his time, *i.e.*, James I., who composed what were called English verses according to Latin rules:—

> "Another scorns the homespun thread of rhymes,
> Matched with the lofty feet of elder times;
> Give him the numbered verse that Virgil sung,
> And Virgil's self shall speak the English tongue:
> Manhood and garboiles shall he chaunt with changed feet
> And headstrong dactyls making music meet!
> The nimble dactyls, striving to out-go
> The drawling spondees, pacing it below!
> The lingering spondees, labouring to delay
> The breathless dactyls with a sudden stay!
> Whoever saw a colt, wanton and wild,
> Yoked with a slow-foot ox on fallow field,
> Can right aread how handsomely besets
> Dull spondees with the English dactylets,
> If Jove speak English in a thundering cloud,
> *Thwick-thwack* and *riff-raff* roars he out aloud!
> Fie on the forged mint that did create
> New coin of words never articulate!"

Almost every one will recollect some edifice in which the architect's desire to be correct has led him into an unhappy application of precedent, which closely resembled the "new coin of words never articulate," "the forged mint" of inappropriate precedent. This is an ever besetting snare to the imperfectly educated pedant, whose anxiety to be correct in outward propriety, may mislead him to overlook that adaptability to purpose, which is essential to all good and enduring architecture. The first step towards literary excellence is not precision in grammar, or the application of derivatives, as the primaries were used in the original language; but such use of words as shall convey the meaning of the writer to the mind of the reader; after this is attained, refinement will follow. So in architecture, the first step towards excellence is, so to design, that in arrangement and appearance the building shall speak with a purpose to all who see it; when the art has attained this position, refinement will follow. I am aware that in architecture, as in the other fine arts, there are those who condemn the voice of public opinion, and profess to address themselves only to the cultivated few. I say they *profess* so to address themselves, because, as they usually crave popularity, and express much indignation if their merits are overlooked, except by the few, the inconsistency cannot be explained, but on the ground that the professed intention is a poor pretence which daily practice contradicts. Why do musicians appear at concerts? Why do painters and sculptors contribute to exhibitions? Why do architects jostle each other in the eager endeavour to extend their practice? but because all desire to be successful; and success is the meed of popular favour! The success referred to, of course, is that which finds its expression in financial emolument; the success which rewards the single-minded and earnest votary of art, it is to be feared, is for the most part unregarded, except in so much as it assists to the other. This being so, the architect should work in a language which his patrons can understand, without the drudgery of a long course of study, for which their ordinary avocations afford neither opportunity nor time. If he will thus address them, they will not be distracted by any deviation from, or adherence to foregone styles; they will simply have to consider how far his work accords with the vague abstraction their acquaintance with the principles of art, such as that acquaintance may be, has led them to form. Nor is there anything derogatory or degrading in this view of an architect's functions. "To stoop to conquer" may be wisdom in art as in love; and the servitude of the master belongs to the highest type of humanity in every condition of life.

Professor KERR, Fellow, said he had great pleasure in proposing a vote of thanks to the author of the paper, which was a very interesting one, entering into many points of philosophical detail to which they were not much accustomed in this room.

Mr. E. B. LAMB, Fellow, said he was glad to hear the subject of design entered into in such an elaborate and clear manner. It was a subject very uncommon indeed, and if it was taken up a little more than it had been hitherto it would be most desirable and instructive, especially to the younger members of the Institute. The paper was so eloquent, learned, and deep, that it was impossible on the moment to enter so fully into the matter as might be done with longer study.. He had very great pleasure in seconding the vote of thanks to Mr. Boult; and he hoped that at some future time the subject would be enlarged upon. He was confident the paper would be read in private with much pleasure, satisfaction, and instruction.

Mr. W. WHITE, Fellow, said that he was quite sure the principles which Mr. Boult had brought forward were held by many in this Institute—viz.: that they should not start from any single style which had a defined expression, so much as from those principles of construction and truth which were enunciated by the requirements of the age we live in, and of the materials and workmanship and other things which influenced it. He differed in one main principle from what the author had brought forward in respect to the eclecticism of the subject. He had always held that the expression of the art ought to depend on the conditions of construction and on those elementary principles which must rule, and which must be the foundation of all good design. In fact all who had written upon ornament had taken that view of the question. Decorative sculpture stood apart from the structural conditions of a building; the design of ornament was inseparably connected with the structure of those natural forms which had been regarded as beautiful from the earliest times down to the present day. There was one other point on which he was not very sure he could agree with the author, who had remarked of the structure of St. Paul's in relation to the dome, that it was a sham construction, inasmuch as the exterior dome was not coincident with the interior. It seemed to him (Mr. White) that this method always had been, excepting in the very beginning of dome construction, analogous to the system of groining. The building had been vaulted in, and then it had been covered with a roof which had been the ceiling till it required an external roof to protect it from the weather. That seemed to him to have been the idea Sir Christopher Wren had with regard to St. Paul's, first of all to make his building perfect inside and then to put on it a sufficient and proper roof.

Mr. JOHN P. SEDDON, Hon. Sec., remarked that the paper was one which would be more enjoyed in the reading than in the hearing. The subject was one of great interest, and worthy of deep thought and consideration, althought it might appear to some not an exceedingly profitable one to discuss. It was well that architects should always be able to give good reason for the faith that was in them respecting their art, as, in his opinion, Mr. Boult had well and tersely explained his. The whole gist of the matter appeared to be included in the remark in which the author said, "I believe originality in architecture will be most certainly secured by an earnest desire faithfully to meet the modern requirements of the building, rather than by uncertain experiments in *bizzarre* effects, or by the painful repetition of effects derived from earlier productions." To put it more shortly, he believed in architecture being "ministerial" rather than "monumental," and that greater attention should be paid to the practical requirements than to the style in which they were going to build. That principle could not too often be put forth, and too deeply impressed on the minds of the young members of the profession. He had great pleasure in saying he fell in almost entirely with the arguments of the paper, and he thought they would all enjoy exceedingly the reading of it over. If another opportunity were afforded of discussing it, he thought great advantage would result from entering upon the subject.

Mr. T. Roger Smith, Fellow, observed that as so much had been said against pedantry, he begged to say a word in favour of learning. He thought there was great danger in the present day, that men should take up the idea that architecture was a thing which had to be wrought out of every day life. If they were endeavouring to do the best they could with refined taste, but with no knowledge of previous buildings, it would be wise to study exclusively the intention of each building. That would be the only thing they could do with any chance of success, working out from the beginning that which would suit the requirements of the case. But they were ordinarily employed to build for purposes, which had been again and again met by men of energy and experience, and they had to work with a material tried again and again by skilful masons and arranged by skilful architects; whatever shape they put the building in they had to work in a style which had been wrought out by men of the highest cultivation from all time; and it was only when a man found himself called on to design with new materials—as was the case with the first Crystal Palace—that he had an opportunity of adopting an entirely new style which owed its exclusive character to adaptation to the purpose for which it was intended. If gentlemen went to work in any style or semblance of style which had been studied, and neglected all previous study in the attempt to continue a work which would fit the case, the result would be bizarre and strange; and such cases were met with in London, particularly in the suburbs. No doubt many opportunities occurred in an age like this of doing something new, but those opportunities were not the most frequent things which occurred in practice; and they should bear in mind they were building in a day when all the forms of architecture were at their fingers' ends, and when they were expected to know something of all that had been done before. They had now advantages which they never had before, even critics were well learned in what was doing, and when they did not build with learning they ended in disgrace. With these few remarks he would express his adherence to the main principles set forth in the paper, viz.:—That the style of the building should subserve the purpose for which the building was intended; at the same time he regarded the works of those who had gone before them as an authority which should guide them in every step and in every effort they made.

The Chairman (Mr. T. Hayter Lewis, Vice-President), in putting the vote of thanks, which had been unanimously agreed to, expressed his concurrence in the opinion that the paper would be better appreciated when read in private, and opportunity was afforded for reflection on it. There were many things in it, he said, which the mind could not grasp at the moment.

Mr. Boult, in reply to some remarks from Mr. Nelson, explained that the section he had put on the wall was intended to show the arrangement of light for the sample counter of a cotton broker. That was a point on which the brokers of Manchester and Liverpool were exceedingly particular, as they alleged that the value of the cotton could not be judged of with indistinctness of light on the sample counters. He represented this point in the construction of a cotton broker's room, and not as illustrating his principles of architecture in an æsthetic point of view.

Professor KERR begged to be allowed to ask Mr. Boult whether he agreed with the cotton brokers in all this "fuss about the light." He (Professor Kerr) would say he did not. His own opinion was that the brokers were desirous of distancing each other in some position in respect to light, to impose upon each other in the shape of reflected light on their goods, showing up perfections which did not really exist. He apprehended that Mr. Boult would not, as an architect, encourage them to hold such ideas.

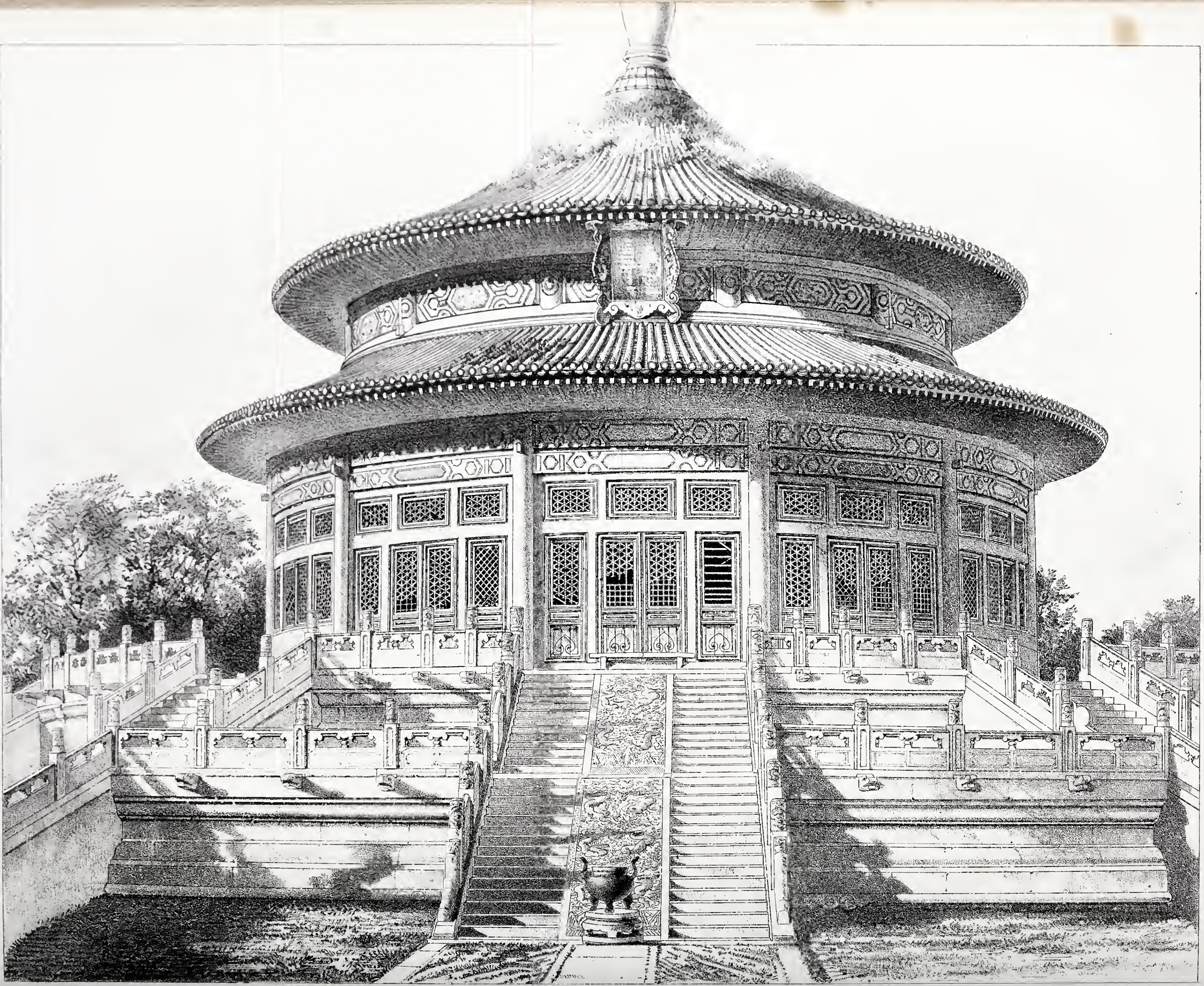
Mr. BOULT recommended architects to find a means of lighting through one opening only instead of two.

Professor KERR observed, as far as he knew about light he considered it a delusion to talk about cross lighting affecting the quality of the cotton. It was merely a desire to distance each other in respect of adventitious circumstances.

Mr. NELSON said that cotton did not stand alone: there were other things which it was desired to get less light upon. He referred to what came upon the sample board.

Mr. BOULT expressed his belief that there was no commodity on which an excess of light had so important an influence as on cotton—not excepting even indigo or sugar. The brokers of Liverpool applied for what the cotton brokers would consider injurious to them, and others required a light which the cotton brokers would not look at. The cotton brokers were people most difficult to suit. With regard to his observations on St. Paul's he referred to the second story over the aisle, which was all blank. Inside there could only be seen one window, but outside they saw two stages of windows, which were lost for all purposes of internal effect. With regard to what had fallen from Mr. Roger Smith he would say architecture was "ever varying, ever new." He did not approve of things being done over and over again; but if they consulted the wishes of their clients, there were scarcely two buildings perhaps, the arrangements of which were so similar as not to leave great scope for the architect. With regard to materials, he might add that modern masons were treating stone as wood; they ought to be on their guard against such an abuse, and to insist on materials being employed in a legitimate manner. He begged to thank the meeting for the reception his paper had met with, and to apologise for its great length, the reading of which had occupied more time than he expected.

The meeting then adjourned.



Lithog^d for the R.I.B.A. by Kell, Bro^s London.

ALTAR OF AGRICULTURE — CHINESE CITY OF PEKIN.

(from one of a Series of photographs illustrating D^r Lamprey's Paper)

ON CHINESE ARCHITECTURE.

By J. Lamprey, M.B., F.R.G.S.,
Surgeon 67th Regiment.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, May 20th, 1867.

It is generally admitted that we can form a very good estimate of the character and genius of a people from an examination of their architecture, in other words, by studying the plan and mode of structure of their habitations, their bridges, their public monuments commemorative of memorable men or historical events, their places of worship or their tombs, in as much as peculiarities of form and design distinguish the architecture of one nation from that of another, and are the expression of their mind and intelligence.

If we apply this test to the Chinese, we may see them perhaps in no unfavourable aspect, at least we shall find them to be characterized as an eminently utilitarian people, and as adepts in making the most of their means to accomplish certain ends: while at the same time they are not altogether unmindful of what is elegant in form or even chaste in design. They also exhibit in a remarkable manner a fixed adherence to certain forms of structure, when once satisfied with their fitness of purpose.

It is no doubt true that, so far as we have yet seen in China, there are no stately edifices, no imposing palaces, or lofty temples, either ancient or modern, at all comparable with those found in India or other parts of Asia; there are, however, structures of a more utilitarian character, surpassing in vastness everything of an architectural character found elsewhere; for instance, the Great Wall of China, the defensive walls round their cities, and some works connected with their canal and drainage system, besides bridges and causeways of considerable length. Be this as it may, there is much to interest us in Chinese architecture, however trivial the example appears, in as much as it presents features peculiarly its own, and many structures show an originality of form and design not met with elsewhere, and a skill in workmanship not surpassed by other nations. It is certainly not for want of materials that the Chinese have not already acquired a fame for architecture, as probably no country in the world could show a greater amount of building, or could surpass it in the abundance and excellence of material fit for building purposes, which are similar to those commonly used by other nations, namely bricks, timber and hewn stones; of the first named there are several descriptions, each being suited to a particular purpose; for instance, to construct massive walls, such as the walls of their cities, bricks a cubit in length and a span wide, are not uncommonly used, while the walls of ordinary houses are built of bricks of much smaller dimensions, some of them approaching the ordinary European standard. The difference in the form and size of these bricks is very variable,—some are flat, being about 10 inches long, 5 inches wide, and 1 inch in thickness; others are 14 inches wide and 3 inches thick; while those in most common use are about 7 inches in length, 3 inches in thickness, and 2 inches in width. Besides bricks, curved and plane brick tiles are used in roofing common buildings. In Pekin the palaces and some of the temple buildings are tiled with glazed yellow tiles, having a very brilliant effect in the sunshine. Flat tiles are used in flooring their court-yards and houses; sometimes they are met with as large as two feet square, and are exceedingly hard and compact in texture. All bricks and tiles made by the Chinese are of a dull grey colour, and hence the sombre grey tint of the walls and buildings throughout the country. The fuel employed by the Chinese brickmakers is straw, and not coal. Nevertheless, Chinese bricks are very durable, hard, and compact in structure. Their colour is not owing to any peculiarity of the soil of the alluvial plains throughout China, which is not very well adapted for brickmaking purposes, on account of containing lime: this is proved by the red tint bricks assume when baked in brick ovens constructed after the European model and heated by coal. Chinese bricks are invariably marked with a stamp, and some of the very ancient ones found in the structure of their temples or other buildings, bear the date, the place of their manufacture, and more frequently the name of the building they are intended for, in this respect reminding us of the marks on the ancient Egyptian bricks. Being of a very fine even texture, bricks and tiles are easily planed so as to join very closely. They are also easily sculptured to form the great variety of ornamental work found over their doors or inner apartment walls.

The timber in common use is derived from a species of fir growing abundantly on the hills of the far interior and conveyed by water in the form of rafts, made sufficiently large to admit of a house being constructed on them, to enable the owner and his crew to reside for months on their long journey down the Yang-Tse and other rivers. This timber is not of a very durable kind, its texture not being compact, and its dimensions not large—the spars average about twenty feet in length, and eight to ten inches at their base.

Timber of very respectable dimensions can be procured in the country, such as the camphor wood, salisburia, and other trees of very large growth, and from such the massive pillars supporting the roofs of larger buildings are made; there are, in short, extensive plantations of large timber trees to be met with. In travelling through the western part of the province of Chili, I have seen some remarkably fine timber trees in regular plantations.

The hewn stone is generally granite, though marble and lime stone are frequently met with; the former is coarse grained and darkens on exposure. Sandstone and grit are also met with; and in the wall round the city of Canton there are blocks of what appears to be red sandstone.

Granite is quarried in a peculiar manner. No gunpowder appears to be used to blast the rock as with us. This would break the stone into fragments too small for Chinese use, or perhaps they were not acquainted with the mode of blasting with gunpowder till shown the art by Europeans at Hong Kong, where it is sometimes practised. The method adopted by the Chinese is as follows:—First having selected a ridge of rock sufficiently long and straight, they chisel out a number of holes a few inches apart, on the line intended that the rock should split, and inserting wedges into these holes, they drive them home simultaneously, till the rock yields by the mechanical force of the wedge, and in this manner slabs and blocks of great size, or spars of granite of very slender proportions and great length are quarried.

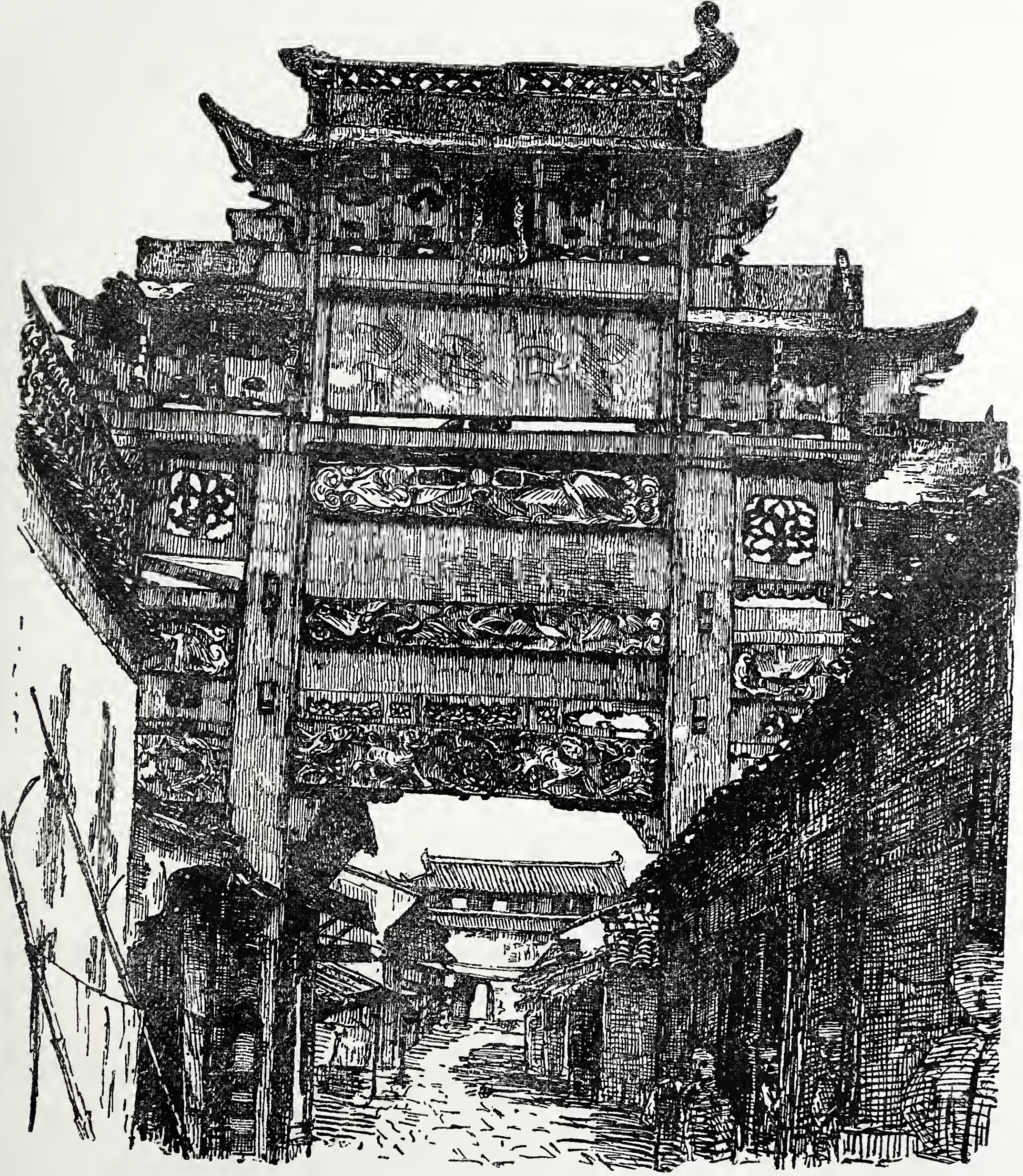
It is a curious circumstance that the ancient Egyptians adopted a similar method of quarrying their enormous megaliths, the obelisks, and to this day the rocks in the ancient quarries of Assouan, at the first cataract of the Nile, bear similar marks of the wedge holes.

Marble is quarried by a more troublesome method; the blocks are chiselled out of the rock bed with great labour, especially when a large monolith is required. I measured a large block of marble that was being cut at the marble quarries at the foot of the Western Hills near Pekin and found it to be ten paces in length, and fully three feet square. It was being prepared for the late Emperor's tomb, and when quarried, it occupied many days, and required a large number of men and horses to remove it to its destination. It was an interesting sight to see a number of men engaged in the work of quarrying—they chiselled away with the same energy, and used tools very similar to those in use by our own stonecutters, while close at hand, there was a blacksmith unceasingly employed in sharpening the blunt chisels.

The Chinese are exceedingly expert at cutting stone, especially granite. In their hands this material appears to be capable of being wrought, with as much facility as timber, in all kinds of joinings and fittings, and in many instances it is admirably sculptured in perforated tracery work, or in deeply under-cut relievo, as seen in the structure of the Pai Loos (Fig. 1).

With regard to lime, it has been stated that this material is a dear and scarce commodity in China, being altogether produced by burning sea shells. This error is one of the many which our recent intercourse with the country has corrected, as we find quantities of lime produced from marble or limestone, burnt in ordinary lime-kilns, resembling our own. Lime is, however, very sparingly used, and

Fig. 1.

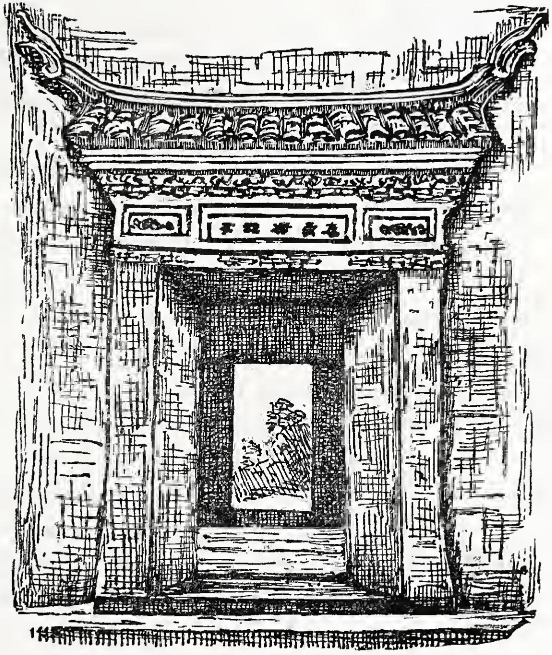


Granite Pai Loo in the City of Ning-po.

it is wonderful to observe the tenacity with which one brick adheres to another, with a slight application of lime merely applied along the opposing margins, and not on the whole of the surfaces.

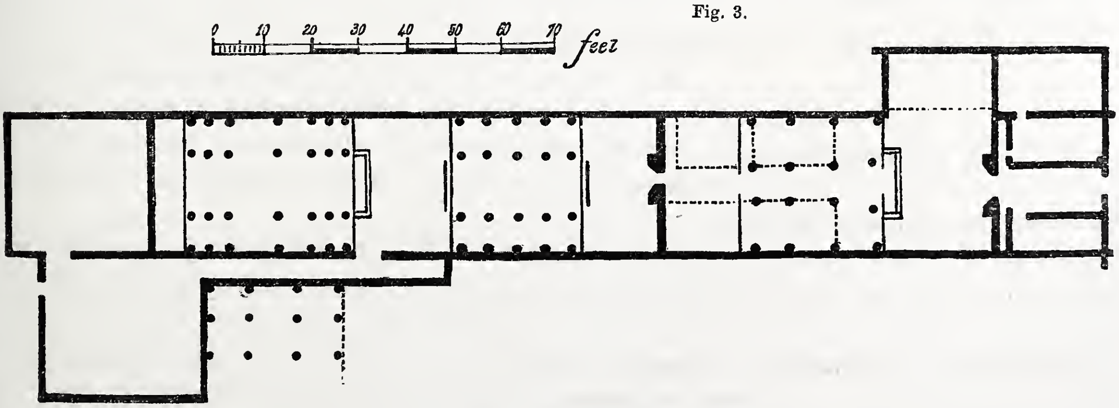
DOMESTIC ARCHITECTURE.

Fig. 2.



Inside of Door of a Chinese House, Tai Tsan.

Fig. 3.



Ground plan of Chinese House, Tai Tsan.

In the common habitations of the Chinese there is but little architectural display; on the contrary, the materials of construction are used in the most economical manner; and the general plan is extremely simple, the houses being almost universally built of one story, in this respect differing from European houses, which are almost universally built of several. The houses of the more wealthy Chinese make up in the extent of the area which they occupy, whatever deficiency they may have in height or in imposing appearance. The ground plan of some of these houses is very intricate, being composed of a series of courtyards with lateral rooms, communicating with each other by narrow passages, or enclosing miniature gardens containing ornamental rock-work, flowering plants, vines, &c., all tastefully arranged. In some houses the inner courts and walls present a highly ornamental appearance, while the outer walls as seen from the street wear a dingy aspect. The doorways appear to occupy most of their consideration in the way of ornament, especially on the side facing the enclosure. We have in Fig. 2 an example of the appearance of an ordinary doorway taken from a house in Tai Tsan, occupied as a military hospital by our troops on a recent occasion.* These doorways are fitted for folding doors, moving in sockets made in each angle of the doorway above and below.. The ground plan seen in Fig. 3 shows the arrangement of a house representing a fair example of a town residence of a well-to-do Chinaman. The greater portion was in a very dilapidated state, like all of the houses in the city. The end rooms had an upper story used by the female portion of the family.

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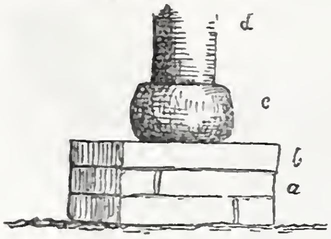
* The graphotype illustrations which accompany the text of this paper were executed from original sketches by the author, who presented them.

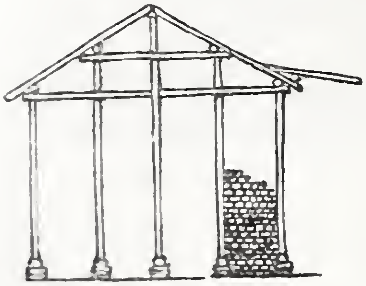
In building a Chinese house of the common sort there are no extensive lines of foundations to be laid, such as are formed for building European houses. A course or two of bricks about a foot and a half square is first laid (*a*), Fig. 4; on this a square tile (*b*) is placed, to support a round stone (*c*) of sufficient width to correspond with the thickness of the timber (*d*) used, and to serve as a base for the support of the upright pillars of the frame work, and to keep the wood from contact with the damp earth. There is often no attempt at concealing these beams by masonry in building up the intervals between the parts, so as to form side walls or partitions; on the contrary the exposed pillars are so numerous that they present a striking feature in the interior of Chinese houses. The side walls are built up very expeditiously by laying a single course of bricks, or by arranging the brick work in the form of a hollow wall; in the latter instances flat bricks are used and bonded accordingly. This mode is generally adopted in forming the outer walls of buildings or of courtyards, consequently they are hollow and wanting in strength. The former method is employed in making partitions, and corresponds with our Flemish bonding. The partition is strengthened considerably by a layer of lime mortar, mixed with coarse fibres of a paper made for this special purpose, and prepared from the fibres of the jute, bamboo, and other coarse fibre-producing plants. This paper is torn up into small pieces and thrown into the fresh slaked lime, and thoroughly mixed, so as to become a sort of pulp. From this it is readily seen how few bricks are required to build a Chinese house, and with what celerity it may be constructed, as in Fig. 5.

Fig. 4.



Support for Wooden Pillar.

Fig. 5.



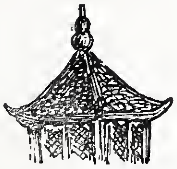
Secondary relation which Masonry holds in Chinese Buildings.

The upright pillars of the framework support the horizontal connecting beams, as in Fig. 5; on these rafters are laid, so close as to sustain a layer of flat tiles. Over these a course of curved tiles are laid, after the fashion of ordinary tile-roofing in Europe. In the central and southern parts of China no ceilings are used, so that there is plenty of natural ventilation. This renders the houses very cold in winter. Leakage is very liable to occur, and the flat tiles often fall, and sometimes do severe injury. The more northern houses are more comfortable, and better adapted to a cold climate; they have ceilings of paper, and the roof is laid on a thick layer of reeds.

The roofs of Chinese houses are always completed before the side walls are commenced, and thus present a most anomalous appearance while being constructed. They generally project over the side walls, so as to form a verandah or eave to shade from the sun, or to throw off the rain from the walls more effectually. In such cases the outlines of the roof present a graceful curve; and a curved line being often found in the outline of the upper ridge of the roof, which is generally terminated at each of its extremities by ornamental projections, no doubt gave rise to the supposition that the Chinese derived the design of their houses from the form of a tent, but a little examination will show that the curve or dip in the roof, not always present, is mainly due to accident in forming the framework of the roof, and to a matter of taste in ornament, the object being to hide the monotonous straight line the ridge of the roof would otherwise present, its presence being unconnected with the plan of the structure.

The form of the gourd is sometimes observed to surmount the pinnacle of a high central roof in a group of buildings, as in Fig. 6; it is an emblematic form, and indicates longevity. The old story of the elixir vitæ being kept in one of these gourd bottles has some bearing on this point.

Fig. 6.



Summit of Central Roof with a Figure of the Gourd.

On examining the plan of construction of Chinese military encamping places, and comparing a large encampment with their cities, an analogy suggests itself. The large official yamuns or courts would resemble the tents of the commandants or generals, which are conspicuous above the tents of the men, and the houses of the people would resemble the tents of the soldiers arranged in rows along the streets and pathways. And it is not at all unlikely that the cities occupy the sites of former encamping places, subsequently made into permanent fortifications, which all cities and towns throughout China are, being surrounded by a wall and ditch, and having the city gates fortified. But there is no further analogy between a Chinese house and a Chinese tent, other than that the roof is supported on a framework of spars, and the tent on a horizontal bar resting on two or three upright poles.

The entrance to a Chinese house is at its side and not at its end, which is the position of it in a tent. Though it is not improbable that tents or rude hutments were the original form of houses with every nation which has developed its own civilization, still the roof of a Chinese house is not made to copy the slope of the sides of a tent, whose sides are usually straight, and made fast to pegs driven into the ground, and inclined from the apex at a more acute angle than the slope of the roof of their houses.

The side walls of the houses of the more northern Chinese are often built of mud, and thatched with straw, or reeds covered with a coating of lime cement, and at about two feet from the ground there is generally interposed a layer of reeds four inches in thickness, the object being to prevent damp from rising up through the wall. These houses are constructed with kangs or raised benches of masonry, beneath which a flue is made to pass in a tortuous manner from a fireplace generally placed outside the room. These fireplaces are made to serve for cooking purposes, the Chinese being ever most economical of fuel. On these kangs the family sit during the day and sleep during the night, their feet being towards the wall and their heads towards the centre of the room. The chimney is a feature in the northern China houses. It does not occupy the centre of the roof as with us, but projects from the lower angles of the gables. In more southern Chinese houses, chimneys so seldom appear they may be said to be almost entirely wanting.

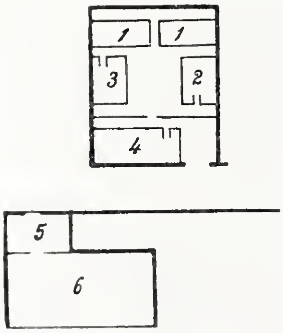
Generally speaking, Chinese cities wear a common aspect, of which the dull grey tiled roofs occupy the most conspicuous part. There is little variation and break, except in the occasional projection of the higher roofs of the temples, and yamuns or official residences, the pawnshops, and occasionally in a pagoda or two; and often large spaces are found inside the walls occupied as gardens, where also high trees are grown, though extensive suburbs may exist outside. The streets are exceedingly narrow, and occasionally lead one to a small bridge on which some labour has been bestowed in the way of sculpture, or underneath a Pai Loo of elaborarely carved granite, though much encroached upon at each side by the houses. There is no attempt at architectural display seen in their streets, the front of their houses being usually low open stalls, half concealed by pendant signboards, of a most flashy character. Within the shops their wares are neatly arranged for sale. The projecting eaves of the roofs above, bare of all ornament, are conspicuous objects, as seen in Fig. 1.

In the more retired neighbourhoods there are unpretending gateways, or dull monotonous grey walls, while in country parts the houses are grouped together in villages, their roofs being little visible amid the foliage of the trees surrounding them. When seen at a distance they present a pleasing appearance, but we look in vain for the roadside cottages, or the stately mansions, with all their associations, we are accustomed to see in European landscapes,

> "Where hedge-rows spread a verdant screen,
> And spires and forests intervene,
> And the neat cottage peeps between."

We have in Fig. 7 a plan of a northern Chinese house, belonging to one of the agricultural class of the population, a cultivator of a small farm of about ten acres. It differs from the plan of the habitations of the same class of Chinese living in Shanghai or Canton, which have no appearance of any particular arrangement beyond the square outline of the house, surmounted by the usual tiled roof, &c., and several such houses being associated together and occupied by different families, who have a common use of a partially enclosed space formed by the houses on each side. In this open space the threshing and drying of corn, preparing cotton, stacking straw and cotton stalk for fuel, &c., takes place. The houses of the more northern Chinese are more private, although collected together in villages; for instance, in one of which (Fig. 7) is a ground plan, the entrance is by a large covered folding gateway, sufficiently large to admit a horse and cart, and to serve as a cart-house; to the left of the entrance there is a room (4) provided with a kang for labourers or friends to occupy as a sleeping place on emergency. This part was separated from the remainder of the building by a yard, which communicated by means of a door with an inner yard, on the sides of which there were separate houselike buildings; the one on the left hand (3) was occupied as a stable and cow-shed, that on the right (2) served as a storeroom for farm implements, grain, &c., and the building at the end of the yard, opposite the entrance door (1), was occupied by the family of the house. This portion of the building was divided into a central hall and two side rooms. The side rooms were occupied as sleeping apartments, being provided with a kang each, warmed by fireplaces situated in the central hall, where cooking and other domestic occupations were performed. On the opposite side of the road, which passed in front of the house, there was an enclosed space (5), used as a farm-yard, where corn was threshed and straw stacked; and beyond this a small space of ground (6) was cultivated as a vegetable garden, and planted with fruit trees. In the more northern parts of China the rooms of the house are designated northern (1), southern (4), eastern (2), and western (3), as seen in Fig. 7. These terms are in common use even with the poorest persons, but are not used at Shanghai or in the further south.

Fig. 7.



Ground plan of Northern Chinese House.

The construction of the cooking places is very simple. One of the large cast metal basins, commonly used throughout China, about twenty inches in diameter, is inserted in the top of a brick-work, about three feet square, in front of which there is an aperture, to admit the fuel, and form a hearth underneath the metal basin, the smoke being carried off through the tortuous flue under the kang, with which it communicates. No smoke enters the apartment, and their fuel, consisting of millet stalk, Indian corn stalk, straw or cotton stalk, such materials being universally used throughout the country where wood is not procurable, is much economized. With the cooking place on each side of the hall the food of the family is cooked, and the house is warmed.

No regular fireplaces like those used in England are found in China, unless in the houses of foreigners residing there. Such structures would be completely at variance with the Chinese notion of economy. Stoves of a very simple form, consisting of a hollow cylinder about twelve to twenty inches in length, with a grating at the bottom, are used. They are made of cast metal or of brass, or clay, or are sometimes built up of masonry set in a framework of wood. There are no chimneys attached to them, so that the disagreeable sulphureous vapours rising from coal remain in the apartment; but certainly the inmates get the full benefit of all the heat. Their coal is not of the same smoky nature as English coal; it is mixed with wet clay, and is shaped into balls of the size and form of the goose's egg.

Braziers are also used for lighted charcoal, which is sometimes carried about in little copper caskets on their persons.

The cooking places of the more southern Chinese who do not use kangs, are built separately, and sometimes stand out from the walls of their houses, owing to so much wood being used in construction They are raised hearths, with metal basins set into them; a flue leads the smoke to the nearest part of the roof.

The internal appearance of the houses of the more wealthy Chinese, is generally very neat, and sometimes richly decorated with wood carving and panelling of very elegant design. In the carving of wood, nature appears to be closely copied, and examples of familiar flowers and plants are generally selected for the design of the scrollwork forming the borders of partitions or screens, and are treated with exquisite taste.

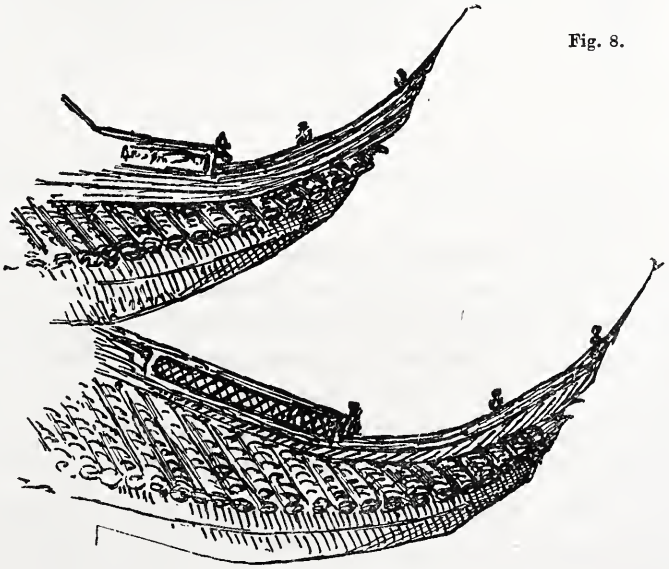
On the other hand, the interior of the abodes of the poorer people of the cities in north and south China, present a wretched, squalid appearance, the walls and beams being bare of all ornament, and the floor uncovered clay, although the inmates may be fully employed in industrial pursuits. The houses being of one storey and the floors commonly on a level with the ground, they are very unhealthy habitations, and materially aid in the development of many constitutional and epidemic diseases.

TEMPLE AND PALACE ARCHITECTURE.

The general plan of the domestic architecture of the Chinese, will serve also to explain much of that of their temples and public buildings, wherein we find the same framework of wood first erected, and the whole structure bearing a considerable resemblance to their houses. And whether Confucian, Buddhist, Lama, or Tauist temple,—in short, in all their public buildings, there is the same principle apparent throughout, although the ground plan may vary.

It would appear that the Chinese look upon extent of area of more importance, in denoting greatness, than height of structure. And thus we find their most remarkable temples occupy much ground in the repetition of gateways, courtyards, and attached buildings, while they have no great height; as in the instance of the temple buildings occupied as the head-quarters of the 67th Regiment in the city of Shanghai, called the Confucian Temple, or temple dedicated to the memory of Confucius.

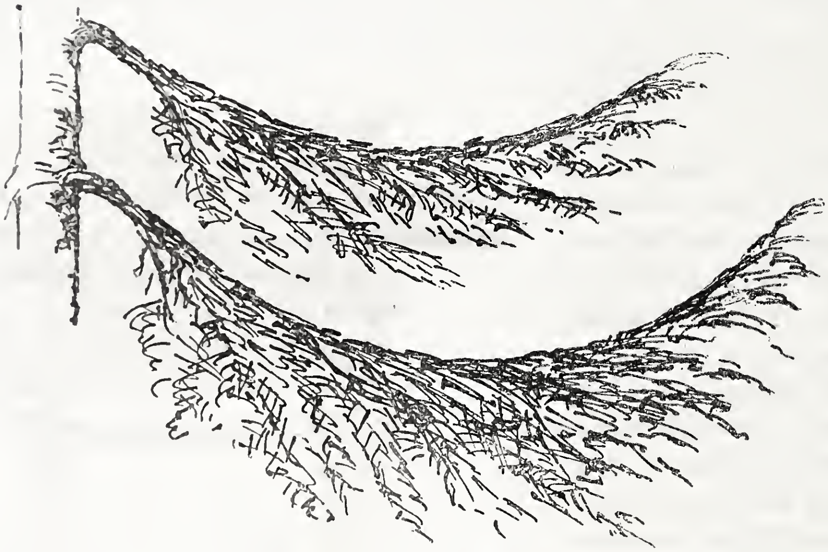
Fig. 8.



Angle of Roof of Confucian Temple, Shanghai.

The height of the principal structure is about fifty feet, and the area on which it stands is about fifty-nine feet square. The formation of the roof is the most conspicuous part of it, being exceedingly large, and by being divided into an upper and lower portion, it is perhaps intended to represent a roof rising out of, or above, a roof, and so implying great honour: just as we see in the temples of the moon and of agriculture. The roof would present a very ponderous appearance, were it not for a very ornamental, high, and perforated band, or ridge, running along it. The ornamental margins of the gables give it a light and elegant appearance, especially in combination with the graceful upward curve of the projecting lower angles. It is this curve in the roofs of the temples and other buildings that forms a conspicuous feature in Chinese architecture. It was impossible to observe this peculiarity during a residence of many months in the vicinity of this temple without seeking for its origin; and at length it struck me that it might possibly be that it had some connection with that graceful curve we notice in the branches of the trees of the fir species, and the little dog-like figures sitting on the upper margin may be intended to represent squirrels running along or sitting on the branch (Figs. 8 and 9). If we were to follow out the principles of form in architecture, we should find many examples of trees and plants lending their aid to the designer.

Fig. 9.



Branch of Chinese Fir Tree.

For instance, the general design of the interior of our cathedrals is supposed, perhaps erroneously, to have emanated from the solemn and stately aspect presented by a grove of trees; or, as the poet describes it,—

> "By pointed aisle and shafted stalk,
> The arcades of an alley'd walk,
> To emulate in stone."

At all events, in the capitals of Egyptian pillars we recognise the date palm, and papyrus, in their embellishment.

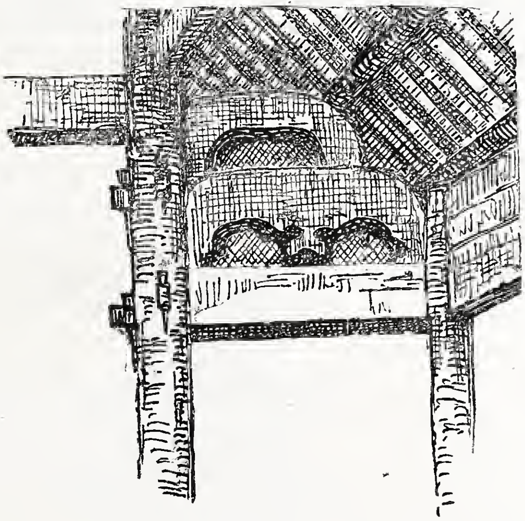
With the Chinese, the fir tree is emblematic of solemnity and repose, and is commonly planted around their tombs. It is a form of vegetation common all over China, and in ages past must have covered all their hills, and been associated with the earliest ideas of their ancestors; though now only thinly scattered on the hills near their most populous districts, it is still found in abundance in some places in the far interior. There are several varieties in the species and genera of *coniferæ* to be met with in China; but the one more particularly referred to in this instance would appear to be that particular species which shows a curving downwards of the extreme end of the branch.

Perhaps if we study other Chinese structures, we shall see a resemblance still more apparent in the general outline, and further, when we come to examine the Pai Fong (Fig. 15), we can detect in its general outline, especially *en profile*, considerable resemblance to the form of the branches of the coniferæ in the projecting corners of its summit.

Although it might be said the Chinese are not gifted with the same powers of observation, nor are capable of conceiving the same ideas of grandeur in design that Eastern nations have exhibited, we must admit that they are not wanting in inclination to admire beauty of form and outline in nature. They cultivate their blossoming plants with great care. They take much pleasure in the first spring flowers, and admire the beauties of the landscape, selecting the most charming views for their graves. Their temples and monasteries are surrounded with natural beauties. There is scarcely a remarkable rock or pinnacle in some districts where we do not find a Buddhist temple perched on its summit, and certainly not disparaging its appearance; on the contrary, many of these structures form striking and pleasing objects in the landscape. Again, in the recesses of their mountains, often reached with the greatest difficulty, we come upon an assemblage of temples which appear part of the surrounding rocks and trees—of nature itself, as it were—so skilfully are the sites of each building chosen, and the proportions of them adjusted. Not far from Pekin, in the western hills, there is one of those Buddhist monasteries, called Shan Fong Shan, built in a deep recess, or gorge. It has been greatly admired by several Europeans who have visited it.

The interior of one temple building would almost suffice for all. There is no disguise of the beams and the rafters of the roof, or of the pillars supporting them, or of the manner of joining them together, as in Fig. 10.

Fig. 10.



Interior of Roof of Chinese Temple.

The supporting pillars, like similar pillars in the common houses, rest on stone bases, and have horizontal beams morticed into them in a similar manner; in some cases the lower beams are not carried across the central space, but are wedged on the opposite side. These beams and pillars are usually painted red, this colour being applied to all walls and interior decorations of places of worship. Another example of the use of red in connection with religion is that of the Hindoos, who have a custom of using a red powder, or red tinted fluid, for sprinkling their clothes during the festival of the Hoolee pourja, and both may have their origin in the colour of the blood of animals slain in sacrifice: we have the example of sprinkling with blood the lintels of the doors at the Jewish passover, and the holy vessels of the temple. White is a colour indicative of sorrow, mourning, or death, and is possibly derived from the colour of snow, the garb of winter, when all nature appears to be dead as it were; yellow, being the colour of the ripe corn and grass, is typical of the earth, the property of the Emperor, and hence it is the Imperial colour, denoting grandeur, power, and state; blue also is an Imperial colour, it being the colour of the sky or heaven, which can only be worshipped through the Emperor.

The horizontal beams are occasionally painted in parts, with a variety of light tints of other colours: in lozenge, angular, or oval outlined spaces, representing a landscape, a bird on a branch, or a well-known blossoming plant. Sometimes connecting beams are introduced, to give additional strength to the framework of the roof, and these are sometimes carved on their under side in scroll outline, which, like the decoration on the horizontal beams, relieves the heavy appearance they would otherwise present, or they are occasionally curved, as seen in Fig. 10.

A peculiarity of all Chinese pillars is this: there is no attempt at forming a capital, no matter how lofty or massive they may be.

The palaces of their Emperors appear to be built on the same plan as their temples and common houses. At the Summer Palace, not one of all the buildings—except those which were evidently not Chinese—was remarkable for its height or exterior decorations; they were all buildings of one story; they had the usual large roof, and wide, open verandahs in front without much external decorations. Some buildings, constructed after the Italian model, and no doubt designed by the Jesuits, would have been the most conspicuous and palace-like buildings in the place, were they not built in a very secluded part of the gardens. However deficient in architectural display, there was an air of beauty and a charm of repose about these Chinese palace buildings, to which the natural beauties of the locality no doubt contributed much.

The lighting of the rooms of Chinese houses has a general sameness throughout the country. Owing to the want of glass, which has been only lately introduced, and not yet used to any great extent, their windows admit a dull light. The state rooms of the larger houses and of the yamuns are lighted from the southern aspect only, by several window-doors, which can be removed, opened, or shut at pleasure. Generally the whole front of these rooms, which open to the court-yard in front, and face the south, is composed of these doors. In the hot weather of summer they are usually all open, and in winter they remain shut, or partially open, as the weather is severe or fine.

These doors reach from the ground to near the roof, and vary with the height of the buildings; they are usually from ten to twelve feet in length, and from two to three feet wide. The lower part, for about four feet, is a panel, ornamented with moulding much like that in use in our own country, and the upper part is an open work of various design and pattern—very commonly small squares, with an aperture of three or four inches; these patterns show much taste and neatness, and admit of great variety of designs, some of which are very characteristic and pretty.

Instead of glass, paper of a thin description is pasted on the inside of the framework, and is occasionally rendered more transparent and durable by being oiled. Latterly, sheets of glass of foreign manufacture are inserted in the windows of the more wealthy people: foreign glass being now imported to a great extent.

In the south of China, the windows are generally found glazed with the small, transparent shell of the *placuna*, cut into small squares of 2½ to 3 inches, and fitted into a suitable framework. They have the advantage over paper, inasmuch as they cannot be seen through by persons outside the room. A great disadvantage attending the use of paper windows, besides their requiring frequent renewal, is that by simply wetting a finger in the mouth and touching the paper, a hole is easily made without any noise, sufficiently large for prying eyes to see through.

Windows of sleeping apartments or side rooms are mostly low, square shaped, and about four feet from the ground. They are sometimes removeable at pleasure. They are set in the wall very much like our own, in a recess, and have window stools, &c.

CHINESE PAGODAS OR TAAS.

Our earliest ideas of China have been associated with the figure of a Pagoda. It is so peculiarly Chinese that its presence in a landscape makes it thoroughly its own. There are frequent examples of these structures all over China. Their peculiarities of construction may be described as follows—they are built up of a series of stories, varying in height from nine to thirteen feet each. There is a winding staircase in the centre, leading from the base to the highest story. The outer extremities of the steps of the staircase are supported by a circular wall of masonry, through which there is an entrance from the stairs at each story, which consists of a space between the inner circular wall and the outer octangular wall, in which there is a passage in each facet, leading to a verandah encircling it (Fig. 11). These verandahs are roofed in with tiles, and are formed by strong beams and supports, and have their angles up turned as in Chinese roofs. They are usually single, but instances occur where two of similar height and form are found a few yards apart (Fig. 12). A description of the most remarkable one probably ever built, the Porcelain Pagoda of Nankin, now levelled with the ground, will be found in the Chinese Repository,* where also some interesting accounts explanatory of the uses of these structures are to be found, showing that they are chiefly associated with Budhism, though whether originally so or not remains to be discovered; some are connected with Mahometan places of worship, such as the one at Canton, but this may be accidental, and not in any way associated with the minaret of the more Western Mahomedan architecture.

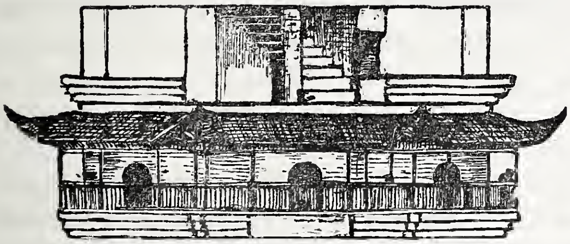


Fig. 11.—Portion of the Interior of a Pagoda.

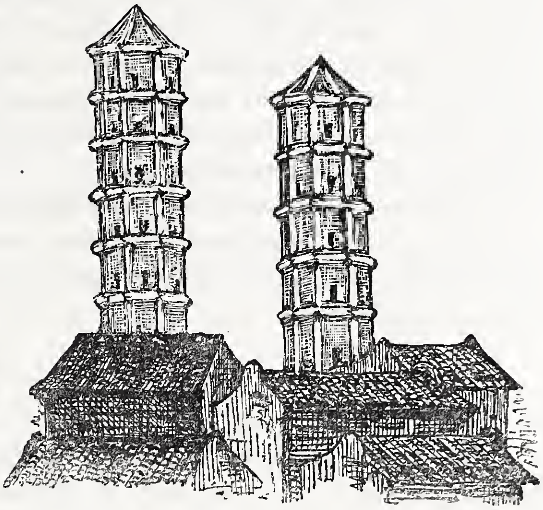


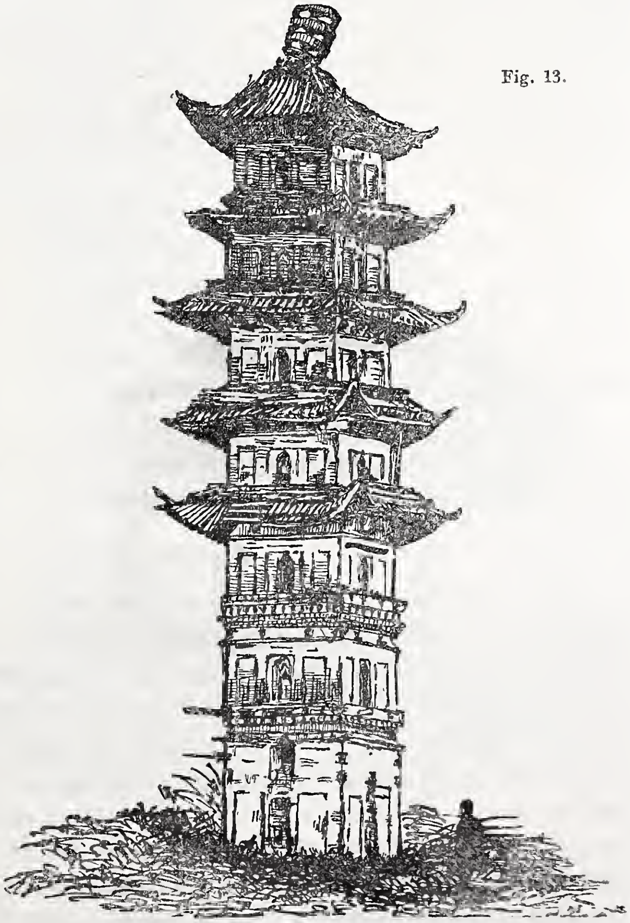
Fig. 12.—Two Pagodas in Chu Chow, North China.

The usual form of the outline of the base of these buildings is octagonal, and may have a mysterious connection with the Pak Kow or cabalistic figure of the "eight diagrams." They are connected with the superstitions of the people, it being supposed that they contribute greatly to the fertility of the surrounding district, promoting the general happiness and welfare of the inhabitants, by exerting an influence over the fall of rain, and restraining the river floods, throughout the area from which they are visible, so that a very high Pagoda must have a very large area under its tutelary protection.

There appears to be some variety in the mode of structure of these buildings, some having a square base, as seen in the Pagoda at Tsing Poo (Fig. 13). This square form would lead one to suppose that they were built after the plan of a look-out, and that their use was to enable the people to watch the district in times of disturbance, the view from the summit of these structures being very extensive.

In 1862 I happened to be in the vicinity

Fig. 13.


Pagoda at Tsing Poo.

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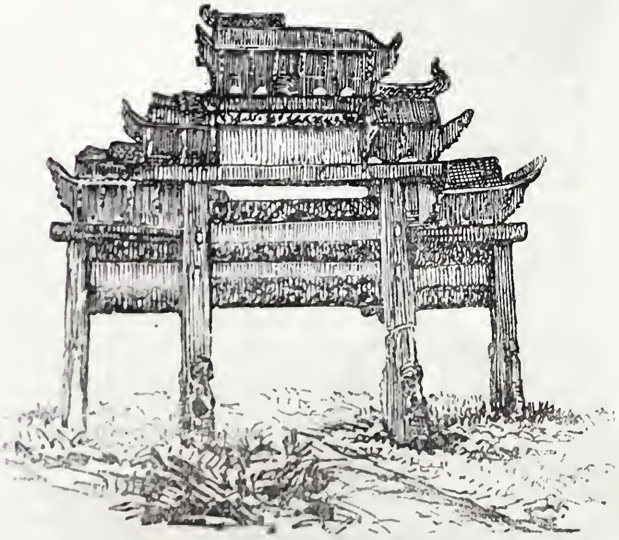
* 'Chinese Repository,' Vol. 13, page 264.

of the Pagoda near Shanghai, at a time the Taipings were in the neighbourhood, and found the interior and balconies full of the people of the surrounding villages, who had taken temporary refuge in the structure, and were observing the movements of the marauding rebels, who were plainly visible from the upper storeys. Were we to find one of these buildings with a circular base and without balconies, which are often wanting in these structures, we would fancy, perhaps, that they were derived from a similar origin and applied to the same uses as the round towers of Ireland, which, though bearing in many instances the symbols of Christianity, could evidently be used as places of refuge and employed as look-out towers to watch the surrounding district, in times of disturbance, independently of being connected with the early Christian churches, and emblems of their power and sanctity, and, like the Chinese Pagados, they also may have been superstitiously supposed to exercise a lucky influence over their neighbourhood.

PAI LOOS.

In the streets of the cities, and sometimes in the fields of the open country, we frequently meet with structures, which arrest our curiosity and make us enquire their use: they are composed of four upright pillars, into which are morticed horizontal beams, generally very elaborately sculptured, and supporting a series of tablets engraved with Chinese characters, and surmounted with a roof, all of which is composed of granite, or in the more northern provinces, of marble (Fig. 14). The slabs, beams, and tablets are fitted and joined together with the same facility, apparently, as if the whole structure were made of wood. By foreigners they are commonly designated Chinese "triumphal arches." However inappropriate this term may be, there can be no doubt that the Chinese Pai Loo is occasionally erected to record military triumphs, as one was found, when Canton was last captured, dedicated in honour of a victory gained by the Chinese over the barbarian English, during the previous war; the conclusion of peace and the departure of the naval and military forces being proclaimed a grand defeat of their enemy. This Pai Loo was purposely destroyed by us on the recapture of the city in 1858.

Fig. 14.



Pai Loo at Tai Tsan. It is much battered by round shot, and the houses about it are levelled.

These structures are generally dedicated to the memory of men who have done some public service. The name of the individual, the nature of his service, and the name of the Emperor who honoured him, are all set forth on the tablet, and the sculpture represents some circumstance in his history, or the ceremonial by which he was honoured by the Emperor or his fellow-citizens in his lifetime. Many of the subjects of these sculptures appear to us exceedingly grotesque, but are easily interpreted by the Chinese, who have a peculiar aptitude for comprehending symbols which appear unmeaning to other people.

However mean, comparatively speaking, the Pai Loo may appear when placed beside some of those massive and elaborately sculptured triumphal arches of Ancient Italy, there are certain shadowy points of structural resemblance worth noticing. For instance, they both rise from four pediments, the aperture in the centre is much larger than those at the sides, both are usually constructed across public roads, and they both have the same object in view, namely, to perpetuate the fame of an individual or the memory of an event of history. At Tien Tsin there is a Pai Loo of marble of much more massive proportions than the granite ones of the south of China.

The very slender appearance presented by some of these structures is quite in keeping with the unprogressive character of Chinese architecture in general, inasmuch as they appear to be mere substitutes for the temporary structures of wood or other perishable material originally employed, such as the temporary bamboo structures erected by the Buddhist priests of Ceylon, in front of their temples, or at places of assembly, to celebrate their religious festivals.*

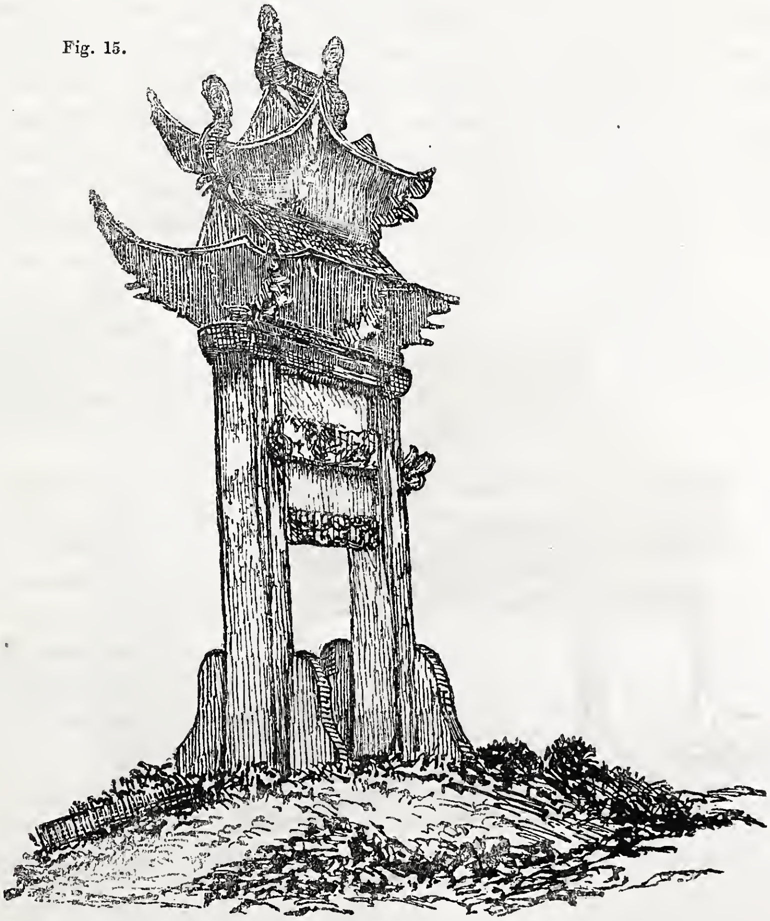
The approach to a temple in Japan is generally known by a wooden structure, having a rudimentary appearance of a Pai Loo, and may have had a similar origin.

PAI FONG.

Smaller structures resting on two pedestals are frequently met with, called Pai Fongs (Fig. 15). They are only dedicated to women, who have lived an exemplary life, and have earned public respect by their charity or other good works. They are also frequently erected by men to shew great respect to the memory of their mothers. Such structures are generally found in some retired locality, and many are often found close together, and in some places are so numerous, that it must have been a very common practice to so honour women.

We notice in the general design of these structures the same reference to nature, and we readily detect the typical form of fir foliage in the projecting angles of the roof-like summit.

Fig. 15.



Pai Fong.

TABLETS.

Large slabs, eight to ten feet in height, and of proportional thickness, resembling in general form the erect tomb stones of old date in our church yards, and rising out of a colossal tortoise, sculptured in the same kind of stone, are frequently met with, especially in the vicinity of Pekin (Fig. 16). These tablets record the meritorious conduct of individuals, and are erected by royal command. The top is elaborately carved with a representation of the double dragon. One of the methods of degrading an individual is to throw down the tablet of his ancestor, if he should have had one erected to his honour.

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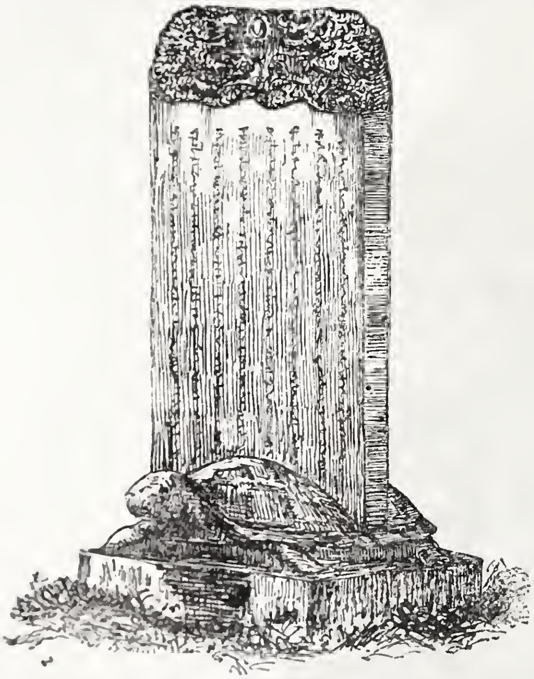
* See the Gateway of Sanchi, No. 972, Fergusson's Architecture.

TUMULI.

In the vicinity of cities in the northern provinces of China, there are always to be found a number of tumuli or mounds of earth, generally about five or six feet in height. These mounds are of conical form, and are simply earth heaped up over the coffins of their dead. They bear a miniature resemblance to the ancient burial places of a tumular or mound form found in some parts of Europe, and probably they represent an ethnological relationship of some importance. (Fig. 17.)

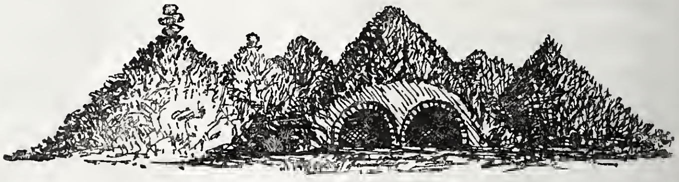
Fig. 16.



Tablet.

Sometimes mounds are found of considerable size and height, and surrounded at a little distance off with a semicircular ridge, higher in the centre, generally twenty feet or so, and sloping downwards to the extremities; the position of this ridge is always north of the enclosed mound, and would appear to have been constructed as a screen to shelter the dead from the north wind. We know how carefully the coffins, while exposed over ground, are wrapped up in straw during the winter season, to keep off the cold.

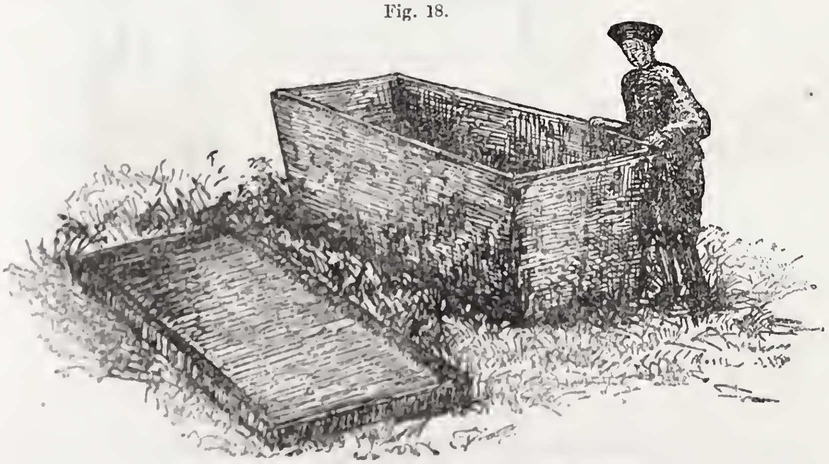
Fig. 17.



Grave Mounds.

This form of mound bears some resemblance to the tombs of the more southern Chinese, who do not construct mounds like the northern people. The tombs of the Cantonese, for instance, are constructed with a large amount of masonry, and have a peculiar horse-shoe form, showing some connection with the general plan of the mounds constructed with an outer high ridge. There are some remains of mounds of large extent found in the vicinity of Shanghai, where a number of sculptured figures of lions, horses, and rams are placed so as to form a sort of avenue of approach to

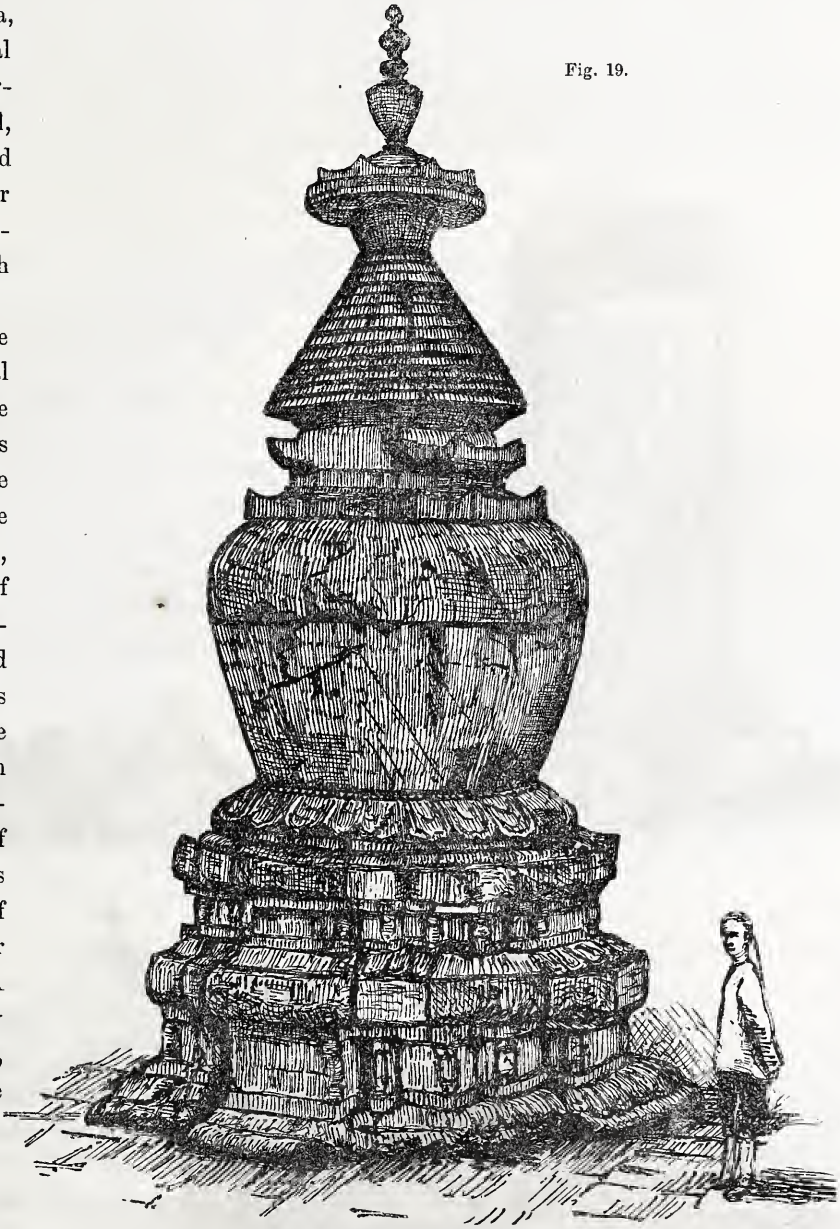
Fig. 18.



Ancient Chinese Sarcophagus, found near Shanghai.

the tomb, near which stand two upright colossal figures in long robes and high square hats, indicative of the ancient Ming dynasty. They are probably intended for Buddhist priests, as they are generally represented with scrolls in their hands, in a reverential attitude, to which their long beards add a very solemn aspect.

Fig. 19.



Dagoba, near Han Kow.

In the north of China, and near Pekin, the burial places are generally surrounded with a high wall, and the enclosure is planted with varieties of the fir or pine trees, a very remarkable species being one with a deciduous bark.

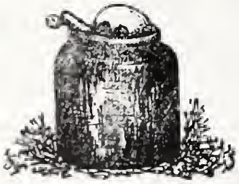
In the centre of the further end of these burial places, the oldest male member of the family is buried; and those who are subsequently interred are placed in smaller mounds, extending along the sides of the enclosure. The summits of the centre mound have frequently three clods of earth placed one over the other, so as to distinguish it from the others, and intended as a great mark of respect. The mounds thus decorated are the tombs of those who were heads or founders of families. A single clod is frequently found on other mounds, and sometimes there are none to be observed.

In some of these grave enclosures, especially in the neighbourhood of Pekin, we find small buildings, often a mere shed, highly ornamented, and containing an altar, on which are placed small tablets having the names of the deceased who are buried within the enclosure written upon them. In other instances the form of an altar is constructed without any covering, as shewn in the illustration, No. 1157, of Mr. Ferguson's interesting work on Architecture. The array of objects there delineated are representations in marble of the altar decorations of every Buddhist temple. In the centre is a crypt for holding a tablet, having the name of the deceased written on it. This crypt rests upon an incense urn, which has got its appropriate stand, and the whole is surmounted by a roof—a very common addition to all shrines in China.

The ornament on the right and left are intended to represent vases for flowers; they are exactly of the same pattern as those met with on every Buddhist altar. The figure to the extreme right is, no doubt, repeated on the opposite side, and is meant to represent a candlestick. The candles and the bouquet of flowers are here sculptured in stone. We may figure to ourselves the male and female relations of the deceased making their obeisance at the customary season of the year, usually in the fine genial weather of spring, before this altar, in honour of their ancestor who lies entombed in a mound beyond. It is not uncommon to find in front of the common earthen mounds a stone resting on two smaller ones, in the form of a rude altar, and the remains of joss sticks, or the paper money, burned in the ceremony of worship, lying on it.

Underneath the ordinary tumuli, near Shanghai, two brick arched vaults are usually found, containing the remains of a coffin or skeleton. Some very old, deserted graves, made excellent ovens for baking fresh bread for the troops when engaged on an expedition near Shanghai. They were previously well purified by fire.

Fig. 20.

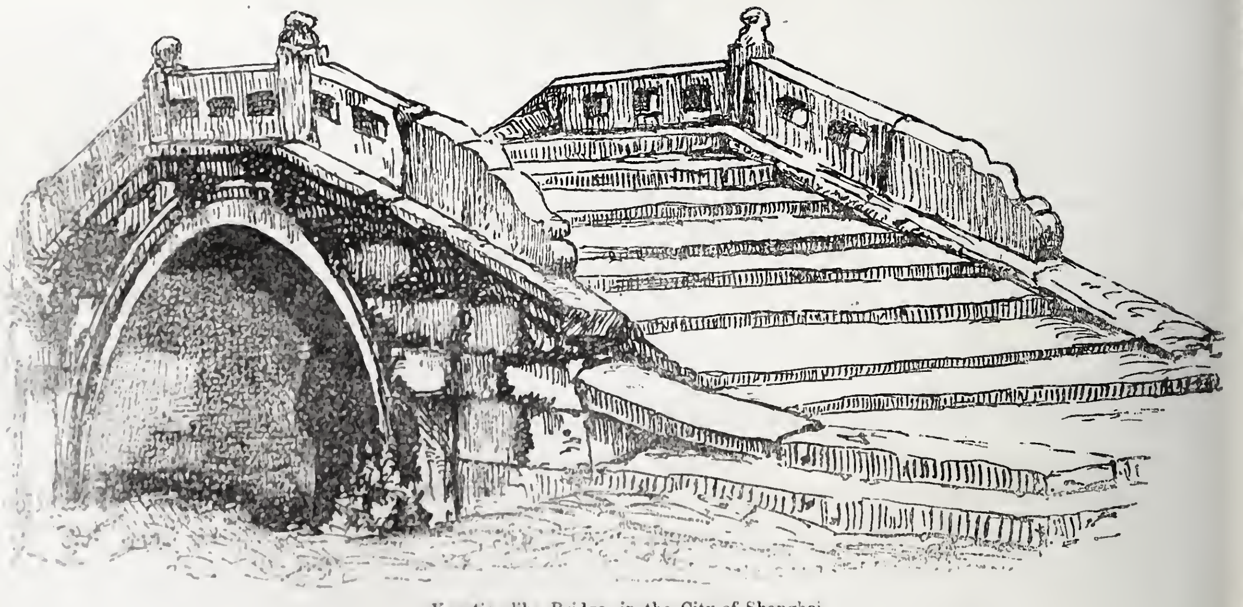


Earthen Jar for preserving the Remains of the Dead.

On removing some of the earthen mounds in the vicinity of the French Concession at Shanghai, several stone coffins, or sarcophagi, were discovered, (Fig. 18). They were sufficiently large to contain a massive wooden coffin. They were hewn out of a large block of reddish sandstone grit, and had a granite slab for a lid, which was made to fit closely by means of a groove in the lid, which received a corresponding ridge on the inner edge of the opening of the sarcophagus. There was no inscription by which the date could be discovered, or to show to whom the sarcophagus belonged.

The tombs of their Emperors are most elaborate in their general accessories, and occupy a considerable area. In the construction of some long avenues, animal forms sculptured in stone are to be found; and at the burial-place of the southern Emperors, at Nankin, besides lions, horses, rams, &c., the sculptured form of the elephant is to be seen. The figure of the lion is represented with a massive curly mane; and there is what appears to be a maneless lion, but more likely intended to represent the tiger.

Fig. 21.



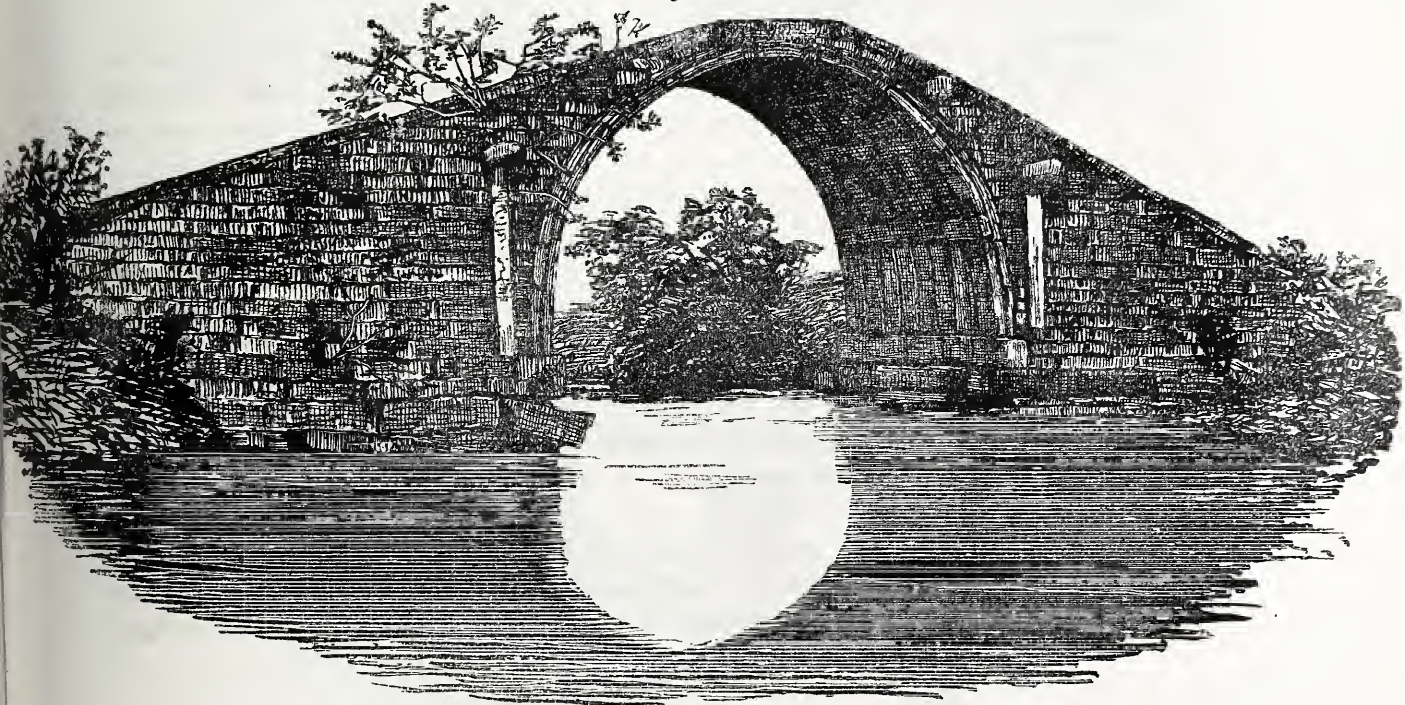
Venetian-like Bridge, in the City of Shanghai.

DAGOBAS.

The remains of Buddhist priests are buried in tombs having a close resemblance to the dagoba form, though only a few feet in height. This form, of the dimensions usually seen in India is rare in China; there is one example to be seen at Han Kow (Fig. 19), and in the interior of the northern provinces I have met with others. Their origin is evidently derived from India.

To show the great respect the Chinese have for their dead, it is customary for them to collect the remains of the skeletons after they have fallen out of their coffins when decayed, and to place them in jars made for the purpose. These jars are subsequently buried in their family burying places, and are frequently seen on the roadside waiting for removal (Fig. 20).

Fig. 22.

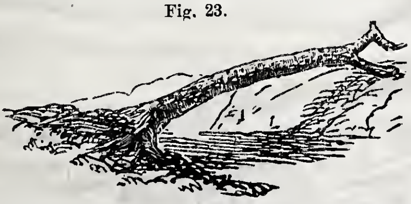


Form of Bridge over the wide Creeks, showing the peculiar mode of construction of the Arch.

BRIDGES.

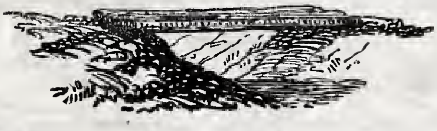
In a country intersected with so many canals and creeks, as the middle provinces are generally found to be, the necessity of constructing bridges must have been attended to at an early period, and in a densely populated country they must naturally be very numerous. We accordingly find in China great varieties of the form of their bridges, from the simple plank of timber laid from bank to bank of their smaller watercourses, to the more substantial and ornamental arched bridge of hewn stone spanning the wide canals and rivers (Figs. 21 and 22).

Fig. 23.



Tree Bridge.

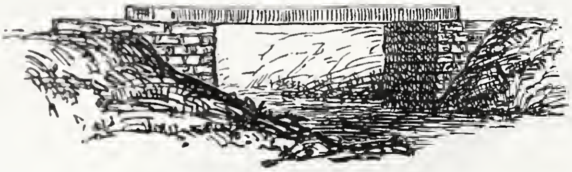
Fig. 24.



Plank Bridge.

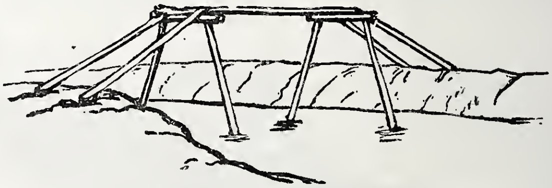
In the neighbourhood of Shanghai, numerous examples of different forms of Chinese bridges are to be found, and they deserve more than a passing glance. The first, as being the simplest form, and that which is, no doubt, the most primitive method of crossing a narrow stream—unless we except the trunk of a fallen tree stretching from bank to bank (Fig. 23)—is a plank (Fig. 24), which the Chinese have imitated in stone, as being a more durable material than wood (Fig. 25). These stone-plank bridges, as they may be called, are sometimes of considerable length—twenty to twenty-four feet long, ten inches in thickness, and thirty inches in width, being very common dimensions. Considerable labour and ingenuity must have been required to get them into their position; and more especially in the construction of the next form of bridge, found crossing their navigable canals—which is the second stage of their bridge architecture—no doubt derived from the idea of the trestle bridge (Fig. 26).

Fig. 25.



Stone-Plank Bridge.

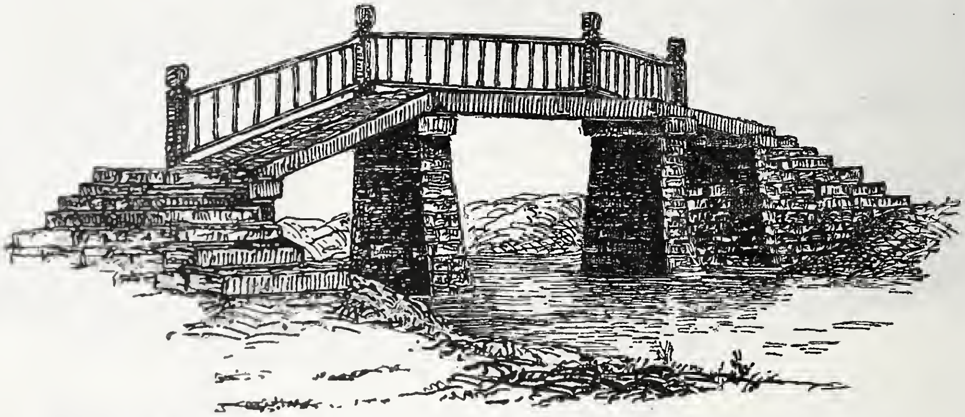
Fig. 26.



Frame-work of Trestle Bridge.

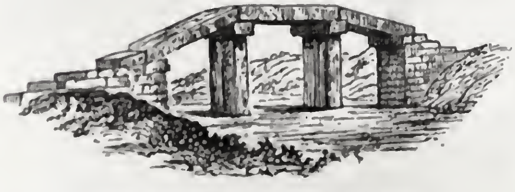
In the Fig. 27 the piers are built of many blocks of stone, though two or three long, upright spars of granite are more numerous (Fig. 28). A peculiarity about these bridges is, that they are close copies of their original models, disguised by no ornament whatever, and yet are pleasing structures to look at; and, though narrow, are suitable to the purposes of a people who do not use carts drawn by horses, such as we use, and where roads are what would be called very narrow pathways in other countries. In the north of China carts and horses are used, because the open country admits of them.

Fig. 27.



Bridge over a Creek near the West Gate of the City of Shanghai. Length of centre slabs of granite, of which there are two, 22 feet; width of bridge, 4 feet 8 inches; thickness of slabs, 9 inches.

Fig. 28.



Bridge with upright Granite Slabs.

The arched bridge is generally found in the form of a single arch, spanning the very large canals and rivers; though bridges of unequal arches, or composed of a succession of arches, such as the fifty-two arched bridge at Pa-ta-Chouw, near Suchow, are to be met with.

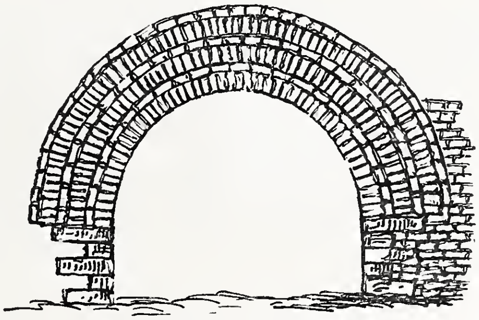
Some bridge arches present spans of very large proportions, and are capable of allowing the largest junks to pass underneath. They are peculiarly constructed, and, however large, present a light and elegant appearance. In Fig. 22 we see an example commonly met with; and, on examining the entrados of the arch, generally of a segment form, though parabolic and other outlines are occasionally observed, we find the masonry of the arch presents a very peculiar appearance. We find first, resting on a foundation of large horizontal slabs, or blocks, a row of upright stones, three or four feet in length, and on the top of these a long horizontal stone, agreeing in length with the width of the arch; the extremities of the stones on which it rests being let into it by a kind of mortice. On the top of this horizontal stone a second series of upright stones is laid, inclined with the head of the arch; and so on till the arch is complete.

Another peculiarity is the absence of any particular way of laying the keystone of the arch. If it is the horizontal stone which comes to the centre, it is not made larger or cut into any particular shape more than the other horizontal stones. There is no ostentatious display of the keystone, such as we notice in European bridges.

The summit of the arches of some bridges is so slender, being composed of a single layer of stone, that the Taiping rebels endeavoured to destroy them, when it suited their purpose, by lighting a large fire on the top, and when the stone was sufficiently heated, water was thrown on the place, which had the effect of cracking and breaking the stone so as to make the arch give way.

Chinese bridges have a very lofty aspect when they cross the larger canals and the banks are low. In such instances they are more like a flight of stairs, being formed with a succession of steps leading to the top. They are very narrow in the central and more southern provinces, being seldom more than nine or ten feet in width, while the bridges of the north are altogether more substantial structures, and more closely resemble our own bridges, inasmuch as they are wide enough to allow their country carts to pass each other.

Fig. 29.



Roman Arch.

In piers or buttresses of bridges of this pattern, it may be commonly noticed that there is an upright stone, extending from the base to near the extrados of the arch, and supporting a horizontal stone which projects a little way from the side of the bridge, in the form of a corbel, the end being sometimes elaborately sculptured. This appears to indicate that, while constructing the arch, the idea of the simpler form of the trestle bridge was not forgotten.

This peculiar mode of bridge construction is almost sufficient proof that the idea of the arch originated among the Chinese themselves, and was not copied from other nations. At all events, we must admit the great antiquity of the people, and that the necessity of arches must have occurred at a very early period of their history. As it is said " Necessity is the parent of invention," arches must have been in use in China at a period not less remote than when first constructed by ancient Egyptians, Greeks, or Romans.

Arches, resembling the old Roman arch (Fig. 29), of considerable size are found forming the gateways of their fortified cities and towns. These are generally made of brick, of which there is an example to be seen in the gates of the city of Shanghai, and in the gateways of the Great Wall. The accompanying diagram shows the mode of bonding those bricks in common use, as frequently employed by our own architects.

The plan of constructing the gateways of their cities is subject to very little variation throughout the country. This consists of a semi-circular projection from the face of the wall, in the side of which, though often found in the front, there is an arched gateway, leading into a small enclosure, beyond which is an inner arched gateway leading into the city. The whole of this structure, which is in keeping with the wall, is devoid of all architectural display, being formed of plain, grey brick work on the outer face, and margined above with embrasures placed at regular intervals. The only breaks in the long line of straight wall—sometimes, in a very ordinary city, three miles in length—are these gateways, and projecting square bastions situated at intervals of about eighty yards, to serve as flanking defences. The wall itself varies from one and a half to two and a half feet in thickness at the top, and is somewhat thicker near the foundation. There is a bank of earth thrown up behind this wall to serve as a banquette, &c. The masonry of the city walls is formed of the largest sized bricks. At about twenty yards in front of the wall there is a moat, forty yards wide, crossed by bridges in front of each gateway.

The vast number of these fortified towns and cities found throughout China, show that it is a country which has been subject to constant disturbances, and the fact of what was once the northern limits of the country being defended by such an extensive line of fortifications as the renowned Great Wall, shows that the country has been at times subject to inroads and disturbances, of which the recent Taiping movement is a modern instance. Perhaps this may account for the absence of any remarkable objects of architectural interest, and for the slender and economical method of building their houses. Almost everywhere in the vicinity of the foreign settlements in China may be seen the devastations of one of those waves of disturbance, which have levelled the houses of large and populous villages and towns. But, knowing the characteristic energy of the remnants of the population, the traces of the general ruin will be obliterated in an incredibly short space of time; new houses will be expeditiously built up on the same model, and with the same kind of material used for ages past—certainly affording them shelter from sun, wind, and rain, but deficient in comfort, and by no means adapted to Europeans.

In this hurried and imperfect sketch of Chinese Architecture, it may be seen that the subject is not barren of interest, and is well worthy of the attention of those more capable of doing it justice than I am. For my part, I make no pretence to be an architect, having merely collected together a few observations during some years I have been in the country, mostly from the temples and Chinese houses occupied as military quarters. I need hardly say they bear a strange contrast with the comfortable and stately buildings daily rising up in the foreign settlements in China, where the varied style and substantial build of the houses of the foreign residents must be indicative to the Chinese mind of power, stability, manly independence, and harmony—the results of a higher and more progressive order of civilization than theirs.

The CHAIRMAN (CHARLES BARRY, Vice-President) said, that before putting the usual vote of thanks, on this occasion so well deserved, to the author of the paper, he thought there were several gentlemen who would like to ask some questions on a subject of such peculiar interest and novelty.

Mr. W. WHITE, Fellow, said, as no one else rose he begged to propose a vote of thanks for this paper, in which he had been much interested; there had been so many points which connected it with the architecture of different places, that he would ask the author to tell them, if he could, the date of that Roman arch to which he had alluded, as it exhibited a singular similarity of construction to arches which were still to be seen in Rome. In the quarrying of granite described, there was also great similarity to the method used in this country, especially in the Cornish districts, where the holes were made with "jumpers." He did not know how it was done by the Chinese, but in other respects the similarity of the process was very great. He would also like to know what was the thickness of the bricks described as being 18 inches square, and how they appeared to be burnt,—whether they were thoroughly burnt, or not much more than sun-dried. In this country it was found to be difficult thoroughly to burn bricks beyond a certain size and thickness. He begged to propose a hearty vote of thanks to Dr. Lamprey for his very interesting paper.

Dr. LAMPREY remarked, in reply to Mr. White, that he believed the date of the wall referred to be about 200 years B.C.; but the date of its completion would be more recent, as it was probable several centuries elapsed from the time of its commencement till its completion. With regard to the burning of the bricks, some of the tiles were as much as 22 inches square and 4 inches in thickness, and were kiln-burnt.

The CHAIRMAN inquired what the pagodas were really used for, and what was the latest record of such use.

Dr. LAMPREY replied, that the pagodas were more or less connected with religion all over the country, and the priests of the religion derived certain revenues from them on account of the influence which these structures were said to have upon the fall of rain and the quantity of water in the rivers, which was so essential to agriculture. The priests impressed upon the people that wherever these towers could be seen they exercised a beneficial influence over the country.

Mr. EDMESTON, Fellow, inquired if the important structures, described in the paper, were really constructed with stone ?

Dr. LAMPREY replied in the affirmative—mostly of granite. The pagodas were chiefly built of brick. The stone work, particularly that of the bridges, was for the most part very beautifully jointed.

Mr. WILSON, Visitor, on the subject of colouring adopted by the Chinese, wished to hear what other colours than white were used in decoration.

Dr. LAMPREY replied, that white was the emblem of mourning. Blue was adopted as representing the colour of the heavens, and yellow as that of the ground, which assumes a yellow colour when scorched up by the sun.

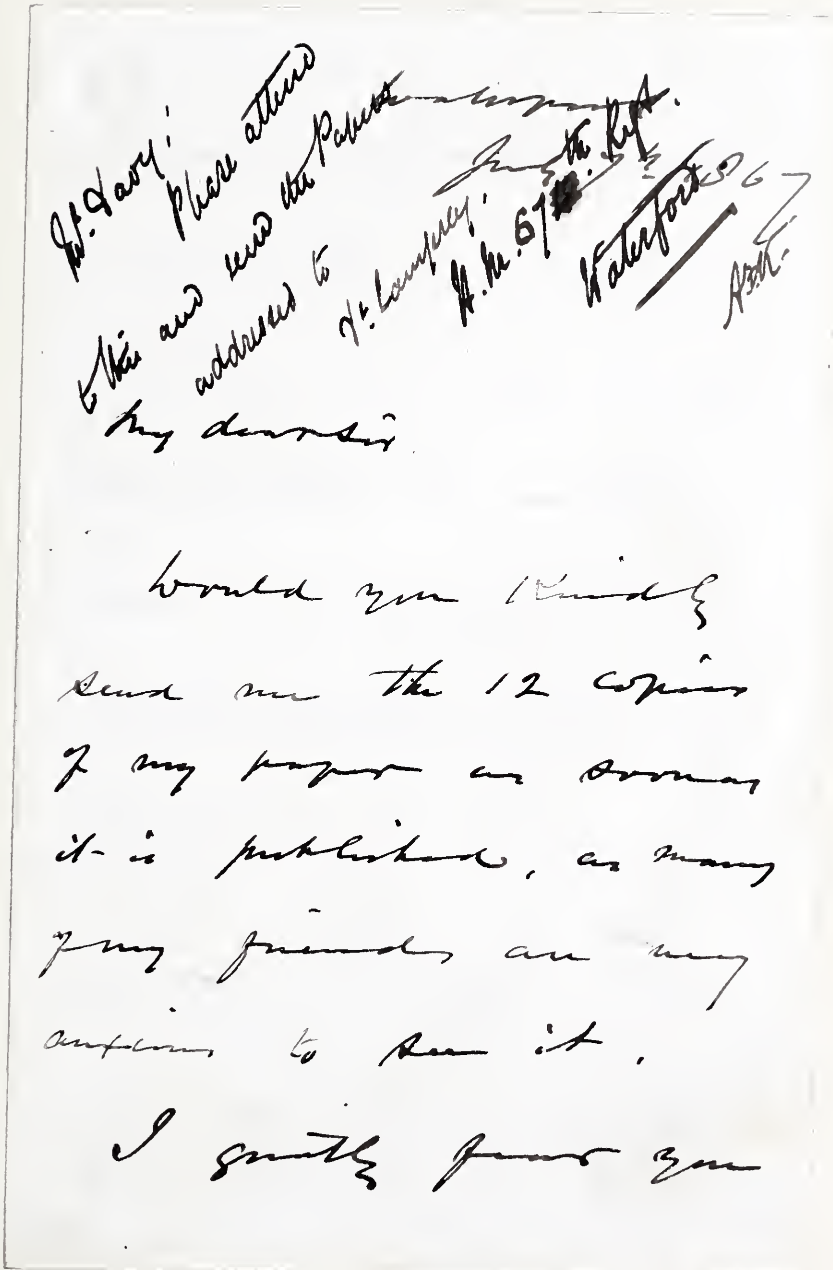
Mr. C. F. HAYWARD, Fellow, remarked, that in a paper so interesting as this it was usual to ask a number of questions, as they were wholly unacquainted with the details, and there were some points which required a little further explanation. He, therefore, would put a question to the gentleman who had favoured them with the paper, but he did not wish it to be answered immediately, because it might interfere with the course of the discussion to answer it at the moment. But it struck him as an important and curious matter for inquiry how these roofs of the houses were carried, especially those with extremely pointed ends. It seemed to him unless such roofs were constructed in a way which he did not at present understand, and also with very great skill and care, in the high winds which sometimes prevail in that country, they were in danger of being blown away. He thought if Dr. Lamprey had turned his attention sufficiently to the construction of those roofs, to give some notion of how that part of the building was carried, it would be interesting; as also with regard to the gateways, the manner of under-cutting the granite, and the elaborate carving with which they were decorated. It was particularly interesting to have the views of a gentleman, who was not an architect, but who had gone so closely into the matter as to be able to describe how the stone was quarried, and to give them many notions with regard to the construction of the arches, which would hardly be expected from an amateur. Amongst the triumphal structures or arches mention was made of one dedicated to a woman. He did not understand whether it was to commemorate some special female character. It would be interesting to know if he rightly understood the author on that point; and in this case he understood him to say there was a peculiarity in the form of the arch.

Mr. CHARLES FOWLER, jun., Fellow, following the example of Mr. Hayward, would ask one or two further questions, a very interesting subject having been brought before them, and he only regretted that Dr. Lamprey had found it necessary to shorten his paper. There was one point which struck him with reference to the construction of the bridges. Those structures were evidently put together more or less upon the principle of the arch, and unless they were backed up it was obvious that they would not stand: and he wished to ask Dr. Lamprey whether he could give them any information as to how the remainder of the structure was filled in. He had not had time to look at the photographs, and at a distance he could only make out the general form of the structures. The diagram, however, represented very clearly the inner shell: on that he thought there must be some mass of material to keep the thing in equilibrium. With reference to the use of granite, perhaps Dr. Lamprey would favour the meeting with a little further information as to the manner in which it was used. He confessed he was not aware before that granite was so extensively used by the Chinese as it appeared to be, though he knew it was used by them to some extent, but he presumed it was used in outside work more as a casing than as forming part of the solid structure. He wished for information on that point. With regard to the roofs, the point alluded to by his friend Mr. Hayward struck him as a very interesting one. The two principal points which he did not understand were as to the use of the granite, and particularly as to the interior structure of these bridges. They appeared to be led up by steps very steep, and no doubt there was not much other material used, but he presumed there must be something in the shape of backing. There was one other point with respect to the construction of the pagodas. Although Dr. Lamprey said he was not an architect, yet the statements given in the paper showed he had been a keen observer; and no doubt he would be able to give them some little idea whether the pagodas were built as we should build a tower, in one continuous wall, or whether they were built up in separate storeys, each storey forming the base of the one above it.

Mr. White added the inquiry, whether the staircases were carried up independently of the walls, or whether they were formed in the thickness of the walls.

Dr. Lamprey, with reference to the roofs, and having sketched their general construction, said that in the centre he had observed a strong beam protecting a series of other stout pieces of wood, which supported the whole roof. These supports were made sufficiently strong by resting upon and being firmly fastened to each other; and the structure of the bent form referred to was sufficiently strong to resist the heaviest gale of wind. With regard to the construction of the pagodas, he believed each storey formed a separate structure in itself. The walls were very stout and thick, and in the centre was a winding staircase, built in the wall very much as we should do it. The roof of each storey was supported by beams of wood, and on those were laid slabs of large tiles, the size of which in these structures was very large. The pagoda represented in the photographs was 117 feet in height, and about 60 feet in diameter at the base. With regard to the sculpturing of the granite, of course the Chinese had iron, and they laboured with iron chisels as we should do; but as the Chinese did many ingenious things, so they were remarkable for their skill in carving in granite. With regard to the backing of the arches of the dridges, he had never seen the interior work of any of them, but only the surface, as shewn in the drawings.

The Chairman, in putting the vote of thanks to the author of the paper, remarked, that grateful as they always were to members of the profession who brought before the Institute matters of professional interest, they must feel especially grateful to Dr. Lamprey, who in the midst of his other pursuits had sufficient love for the subject to lead him not only to observe so keenly as he had done, but to reduce his observations into such a form as that in which he had presented them this evening. He had taken them to a new field of thought altogether, and there were very few, if any, who could contrast their Chinese experience with his. He (the Chairman) felt exceedingly interested in the varied information which Dr. Lamprey had given them in connection with the subject of his paper. Among other matters, Dr. Lamprey had alluded to some large blocks of granite provided for monumental purposes, as much as thirty paces in length, and of proportionate dimensions in other respects, which reminded him of the extremely ancient times when very large monoliths were regarded as monuments of grandeur and honour to those whose memory they preserved. The questions which had been put by the various speakers had, some of them, occurred to him, but he was saved the necessity of asking them; and it only remained for him to beg the meeting to award to Dr. Lamprey—as he was sure they would do—an enthusiastic vote of thanks for his extremely interesting communication, adding a hope that on some future occasion that gentleman would favour the Institute with further details on the subject than he had been able to give that evening.

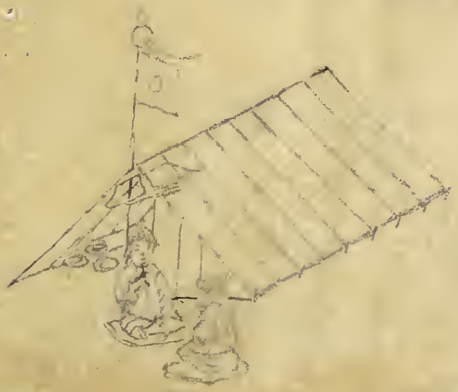


Mr. Davy:
Please attend
to this and send the Pamphlets [illegible]
addressed to
Lt. Lamprey: H.M. 67th Regt.
Waterford [illegible]
T.H.H.

My dear Sir

Would you kindly
send me the 12 copies
of my paper as soon as
it is published, as many
of my friends are very
anxious to see it.

I greatly favour you



Chinese tent after a Japanese sketch.

Pai loos.

In the streets of the Cities and sometimes in the fields of the open country, we frequently meet with structures, which arrest our curiosity and make us enquire their use, they are composed of four upright pillars, into which are mortised horizontal beams generally very elaborately sculptured, and supporting a series of tablets engraved with Chinese Characters. and surmounted with a roof all of which is composed of granite or in the more northern provinces, of marble. The slabs ~~and~~ beams and tablets are fitted and joined together with the same

is supported on a frame work of spars. and the tent, on a horizontal bar resting on two or three upright poles The entrance to a Chinese house is ~~at~~ its side and not at its end, which is the position of it in a tent. Though it is not improbable that tents or rude hutments were the original form of houses with every nation which has developed its own civilization, Still the roof of a Chinese house is not made to copy the slope of the sides of a tent, whose sides are ~~usually~~ usually straight and made fast by pegs driven into the ground, and inclined from the apex at a more acute angle than the slope of the roofs of their houses.

REMARKS UPON GRINLIN GIBBONS,

As made to the MASTER of Trinity College, Cambridge, and A. J. B. BERESFORD-HOPE, Esq., M.P., in the Library of Trinity College, Cambridge, in November, 1863,

BY W. G. ROGERS.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, 3rd June, 1867.

SOME carvings of Grinlin Gibbons are laid on the table of the Institute this evening by the kind permission of the Master of Trinity, at the particular request of A. J. B. Beresford-Hope, Esq. M.P. (then President of the Royal Institute of British Architects), whom I had the unexpected opportunity to meet, together with the Master, in November last, at which time a careful inspection of the state of the wood carvings was gone into with a view to their restoration, and when it was determined that I should bring away the two specimens laid on the table. This was a precaution necessary to be taken in order to assist the carver in the work of restoration, in case he had to create a new flower, or a branch, or even a whole group if so far decayed as to be unfit to be put up again, such as is the light scroll shewn in the illustration to this paper, and which was taken from an arched recess on the left of the figure of Lord Byron. This peculiar description of light interlacing scroll-work was originated by Gibbons, and is to be met with in most of his important works: it died out with him, and no one has successfully attempted to carry it on since his time. There are several examples at Belton, and in the chapel and state rooms at Chatsworth, in the fine trophies at Kirthington Park, and in Mr. Rhodes's shield it is introduced as the mantling; but the upper part of the reredos at St. James, Piccadilly, is a most marvellous specimen: it was injured during the past century by a ladder falling against it, and when I last saw it had been partially mended with bands of wire. The white marble font in the same church is also by Gibbons, and is introduced in the title page of the Transactions of the Antiquarian Society.*

The reredos in the church of St. Nicholas, Abchurch Lane, is one of the richest in any of the City churches, and deserves to be better known; large masses of festoons and pendants of fruit and flowers cover the whole width of the wall up to the cornice; this has been *painted* over in the same way as the carved work at St. James's, Piccadilly. The horizontal bands on the great organ in St. Paul's Cathedral are the perfection of this character of foliated scroll-work; these were engraved in the Art Journal for 1866, page 10.†

THE LIBRARY OF TRINITY COLLEGE, CAMBRIDGE.—This library is 190 feet long, 40 feet wide, 38 feet high, and has a flat panelled ceiling, and nine windows on each side. This noble room is panelled all round up to the sills of the windows, and on either side are fourteen projecting presses, with a bold Corinthian cornice breaking round them; upon the frieze of each are coats of arms, crests and other devices embedded in masses of fruit and flowers, and carved in the white lime tree wood. The front of the presses are panelled with enrichments raised out of the solid oak. The Episcopal carving, shewn in the illustration, is one of them. All these have been tampered with at some early time, and much of the delicate finish rubbed down, and they have been washed over with some transparent glaze or gum. We often find old Dutch and German carvings so treated.

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* The large pulpit is not from the design of Sir Christopher Wren, nor is the carving by Grinlin Gibbons.

† I remember seeing in the church of St. Michael, Crooked Lane (since taken down to enlarge the approaches to London Bridge), two curious pieces of carved drapery by Gibbons, representing curtains hanging on a rod by rings placed on the back of the high pews as a screen; there were other smaller objects of interest in the church. I have often regretted that such choice little bits have not been preserved in the City Library at Guildhall, as they are sure to be lost when they fall into private hands.

By far the finest carved work here is on the panelling at the ends of the gallery over the pediments, door heads, and the arched recesses, but these at some former time have been thickly painted over, back and front, with oil paint, which has been fatal to the preservation of the wood, preventing the escape of the insects within, which are now compelled to feed on the last bit of woody fibre, leaving us nothing but the *skeleton* of what it once was.

Four out of the twenty-eight presses are wider than the others; these are used as cases for choice objects of art, and have perforated scroll-work panels carved within and without. During the examination of these lattice doors, I ventured to go rather critically into the style and peculiarity of this scroll-work, tracing the interest I had taken in the subject then being discussed to a period before 1807, the date of my indentures being January 29 in that year, when I was bound, before the Chamberlain of London, to David McLauchlan, of 3, Printing-house Square (it used to be Printing-house Yard), and enrolled in the Worshipful Company of Shipwrights, the motto of which is "within the ark safe for ever."

At that time there was a clever old man in the employ of the firm named Richard Birbeck, with whom I was ever in good favour; he took some pains with me in giving to me useful hints in drawing and modelling, seeing the eager anxiety I showed for information. It was a pleasure to him to talk of his early days. He was a native of Stamford in Lincolnshire, and served the whole of his time to the master builder, with the *house carvers*. This was a term to distinguish them from the *ship carvers*: the former were used to flat and square surfaces, the others were always engaged on the rake or fay, as was the old term. Birbeck was a fairly educated man, wrote a good business hand, and possessed a good store of varied information. He was therefore companionable for Thos. Stothard, who was at that time engaged on the grand staircase at Burleigh. I had, therefore, Birbeck's own version of the several stories which have come down to us of their several likes and dislikes. He would get excited when talking of the rural sports and village games he had had with Stothard. Stothard would visit my Collection of Art Works in Soho; at that time I had the fourteen panels of sacred subjects, carved by Bergie, from the backs of the stalls in the Abbey Church of Parc, near Louvaine: these he would pleasurably linger over, particularly the Simeon in the Temple, now in the possession of J. S. W. Drax, Esq., M.P.

ST. PAUL'S CATHEDRAL.—He frequently took me to St. Paul's, which he made me look upon as the most perfect building in the world. I believed it, until it became a part of my religion in art. Among the many carvers employed at Burleigh, there were some who had worked under Gibbons on the Cathedral. From these men he had obtained much interesting information, so that he was able to take me round the outside of the building and point out the varied friezes under and over the windows, distinguishing those executed by Flemish and French workmen from those by the English carvers, which have the loose freedom of some of the *wood carving* of Gibbons. It seems as if a master-mind had not overlooked the subjects, as there would, in such case, have been more uniformity; for some of the friezes and upper festoons are quite undistinguishable. I will only mention one point as regards the interior. Under the great dome are four spandrils with bold oval enrichments: the one in the *North-East*, over the figure of Dr. Johnson (at that time in the shade of the great French and Spanish flags and pennons which hung from the Whispering Gallery), was the first executed of the four, and may be called *the key-note* for the other three. In that one every detail can be clearly made out, and the intention of the artist understood, while the other three are comparatively heavy and confused.

I completed my apprenticeship, on the 29th of February, 1814, and my juniors were called into the counting-house to meet me, when our good master made an address to us, and then presented me with the freedom of the City of London, and promised the same mark of approbation to all who did their duty. Subsequently I began business on my own account, and took Birbeck into my employ; but though he had a free hand, and a bold and vigorous cut, I have since been surprised that, from his being brought up at Burleigh, with so much of Gibbons' work about him, that he knew nothing of the simple style of that master as a carver, but had degenerated into the French frill and shell ornaments, adopting the S and G lines of Chippendale, of which he was a master, and did not even object to carve in yellow deal, a wood which *now* we should shrink from using. Yet all the fine carvings at Blenheim, Kidlington, and Wimpole are in this hard-grained wood, while in the age just before nothing but limetree and soft wainscot were used.

Cashiobury.—Having heard of sundry carvings at Cashiobury, and having obtained permission from the Countess of Essex to see them, I found room after room covered with the finest of Gibbons' work—dead game, wild flowers, scrolls, live birds in the softest plumage, masses of fruit entwined with delicate tendrils—all as pure as when the carver left them. I was well satisfied with my day's work of inspection, presuming on another pilgrimage to this wonderful display of Gibbons' work; but it was not until November, 1865, that I was able to make a second visit to Cashiobury, after a lapse of more than thirty years, when I found that all this charming work had been covered over, and loaded with a thick brown paint and heavy varnish; all the delicate feathering of the birds and veining of the leafage were effaced, smothered up and had vanished; and what repairs had been made, were wrought in plaster or a composition. I could not conceal my mortification and regret at the great mischief which had been done. Examining a flower about the size of an orange, I found it was nothing but a skin of dust, with just enough fibre left to save it from collapsing in the handling.

I could not learn if any documents existed so as to trace the works here direct to Gibbons. It is satisfactory to have documents to refer to, in these inquiries, as his name is frequently associated with works which he never could have seen, and which would have disgraced it. I could name some of our great Companies' halls in the City which have been mis-described in this way. But an experienced hand and eye will not wait for vouchers, and the expert knows that Gibbons created a school in England, and adopted a style and manner in building up his fruit and flowers to produce a grand effect. He chose but very few varieties of these out of his garden, and it is marvellous how he varied and played with those few.

Of the great works at Chatsworth, his name may not appear in the records; but, nevertheless, this was his school, and there he educated his workmen, who partook of his inspiration.

Lyme Hall.—There is a considerable amount of Gibbons' work scattered over the rooms, the great hall, and staircase, and in all that part of Lyme Hall, near Disley, the seat of W. C. Legh, Esq., which was erected under the direction of Sir C. Wren.* Mr. Legh told me he understood the work was executed by the persons who were employed at Chatsworth, and that it took nine years to complete it. This is a very extraordinary pile of buildings, and the contents are as deeply interesting. Some portions seem to date as far back as Henry the Seventh, and each succeeding age is well represented. Those of Elizabeth, James the First, Charles the First and Second, and Queen Anne—and even later, when Leoni united the two wings with the fine Italian garden front, by the long galleries of ancient tapestry, genuine pictures, the quaint furniture of the time, state beds, the toilette of Mary Queen of Scots, with its old brocade and lace hangings, and the chairs, tables, and glasses, all of which are genuine and full of historic interest. Nor is this catalogue of alterations complete, for Leoni's work is again capped or disfigured by the square, low-stunted tower which Sir Jeffry Wyatville placed over the fine Italian pediment.

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* When I was engaged on the interesting chancel and reredos at Harefield Church for C. N. Newdegate, Esq., that gentleman told me that he had at Arbury the original accounts of Gibbons for the carvings done there.

VANDERMÜLIN.—About the period of Louis the Fourteenth Malines was remarkable for its wood carvings, and the inhabitants might be seen sitting at their doors in the streets, plying their art in the same manner as now in many of the German and Swiss towns at the present day. This information I had from Birbeck, and it rather strengthens the remark of Evelyn, that Gibbons came from the Low Countries.

At a meeting of the Society of Antiquaries, a paper was read from Mons. De Laperier, of the Belgium Legation, relative to a document found among the records of Flanders, tending to prove the Flemish origin of many of the works of art and decoration still preserved in England; the works of Flemish carvers in wood were in great esteem, and there are numerous fine examples in the churches of Norfolk and other parts of England, which may be regarded as their productions.

MELROSE ABBEY.—Another document found, refers to a dispute which took place in the year 1441, between William Cerebis, a Scotch merchant, and a monk of Melrose Abbey, acting on behalf of Ed. de Aittre, a master carpenter of Bruges, who was to supply certain stalls for Melrose Abbey, after the fashion of the stalls in the Abbey Church of Dunis, in Flanders, and carved according to the design of those which existed at Thosan, near Bruges.

CARVING IN THE CHAPEL OF TRINITY COLLEGE.—I called the attention of the Master, and of Mr. Hope, to the memorandum I had made in the chapel, remarking that the most finished portion of the work, both at King's and at Trinity, are the screens; that in the body of the chapels having been left unfinished. The two stalls of the Masters, with their canopies executed in rich dark oak, are the perfection of this school, the four cherubs' heads in the cornice are as lovely and life-like as the heads of the Dequesnoys. The desks or book-rests in front of the seats, have delicately carved mouldings like lace work, the body of the chapel is lined with oak paneling up to its Corinthian cornice; it has a rich frieze divided into ten parts on each side over the long line of seats, consisting of shields of distinguished persons, or curious conceits, these are all profusely embellished in flower work in the manner of Gibbons, but the parts are much too small to be properly seen from the body of the chapel. The four first from the Masters' stalls are the best executed, but there is something wanting throughout the whole to produce a good effect: they are all over-crowded. At each end of the two long back seats, against the wall paneling, are inverted trusses, or arm rests; they are about 5 feet high, over 1 foot wide, and 3½ inches in thickness, carved in fine oak; they are chopped in with the daring hand of a master who knew what he was about. There is a long wild running piece of foliage just under the elbow, crisp and as fresh as the first leaves of spring. About half way down the chapel on either side, are projecting desks with perforated panels in front, but of very inferior carving, without any perceptible intention; I attempted to sketch them, but there were no lines to follow. The very fine altar rail is divided into eight panels of massive Roman foliage, worked on both sides; it is as well to span one of these noble branches to judge of their power. The great altar piece is a heavy architectural composition, with a redundancy of ornament, very dark in colour. I asked if the library contained any drawings or plans for the interior fittings? when the Master told me they were with Wren's other drawings in the library of All Souls, Oxford. This information determined me to visit Oxford.

ALL SOULS LIBRARY, OXFORD.—Here every facility was granted me to inspect the drawings by Wren in the library.—There are three large volumes, the first of which has a brown tinted portrait of Sir C. Wren. Drawing 54 is the only sheet which refers to the library of Trinity, it is the simple elevation, with the ground plan, and an extra thought for the vestibule, without any hint as to the interior fittings, which were the object of my visit. Turning over the drawings to No. 74, which gives the Queen's Bed Room, at Hampton Court, on the left side of the sheet, are some long panels drawn to a scale of about 1½ inch to a foot, and here for the first time I thought I could see the sketchy hand of the carver Gibbons: one of them represents three entwining garlands of primroses at the top, from which are suspended the usual pendant of fruit and flowers, the other one is more simple; they are put in in brown ink and slightly etched up, which is not the case with any other ornamental drawings, the latter being merely washed in with indian ink.

THE CHAPEL OF TRINITY COLLEGE was the next place that I visited.—The outside has nothing inviting; as seen from the lawn, it is more like one of our ninety-five city churches than any other building in the University. The rooms in the clock tower contained the carvings referred to in Skelton's "Oxford," but I found that that author has actually engraved two of the very inferior carved pendants, leaving the wonderful works in the chapel with only a bare notice. The carvings were all as pure as they had been left by the carvers, when I visited the Chapel a few years since. The east, or altar end of the Chapel, is executed in cedar, the reredos is Corinthian, the two noble fluted pillars support its cornice and arched pediment, on which are placed two angels holding palm branches, clothed in drapery as wild as if from the hand of Roubilliac; the frame work which encloses the painting is garnished on the top and sides with the finest of the work of Gibbons. The two pendants may be 13 feet long, and about a foot wide; in the centre, at the top, is a vase of flowers resting on the heads of two cherubs, from the vase floats fine scroll work, and swags of fruit and flowers passing on to and over the wings of angels, and then falling down the sides of the framing, producing matchless pendants, relieved with angels' heads, whose fluttering wings seem to play among the flower-work, *but all this fine carving has been painted white*—for what purpose I cannot conceive. On either side of the great centre, over the plain paneling, are carved entablatures decorated with fruit and flowers hanging from the wings of angels: these are painted white also. The altar-rail consists of open scroll work on the principle of those at Cambridge and Winchester cathedrals. The noble cedar screen which separates the vestibule from the choir, is a reflex of the altar, repeated back and front. The four Corinthian pillars supporting the arched pediment, on which are placed the four Evangelists with their emblems, agreeing with the two angels over the altar; the side panels here, are open-work and scrolls, enriched with charming heads and flowers growing out of the massive leafage. They may be about 8 feet high, 3 feet wide, and from 2½ to 8 inches in substance. The seat fittings and walls are all of wainscot. On the left side of the altar is a 15th century illuminated alabaster monument of the founder;* but this is encased in a closet of cedar, which has its reflex on the right side of the altar, used for the vestments, so that there is not one object to mar the perfect unity of the whole design.

The verger may continue safely to tell the visitors, that this chapel is considered the finest specimen of Gibbons' work in either of the Universities. The beautiful enrichments of the ceiling are in perfect harmony with the fittings, and worthily crowns the whole grand composition.

When I was there, I complained to the verger that I could not make out the faces of the angels on the altar pediment, but when I put my hand on the open-worked panels, I found that they had been painted over with a thick oil, darkened with Vandyke brown, which is now as sticky and as moist as if it had been done over less than a week ago. In this way have been damaged the six figures on the pediments, the open-worked panels on the screen; and, in truth, all this glorious work of Gibbons, wrought in costly, richly, sweet scented cedar, is now covered over with a dirty undrying oil. Sir Christopher might as well have ordered these carvings to have been done in common fir, if they were to come to this.

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* Vide Spiers' 'Colleges of Oxford,' with coloured illustrations.

WINCHESTER.—At Winchester, the altar rail in front of the high altar is by Gibbons; it is after the type of the others I have mentioned. It looks liney when one is close to it, but from the choir or body of the church it has a rich and full effect; it has been painted very dark to agree with the extraordinarily fine canopies over the stalls, which are of the 14th century.

KIRTLINGTON PARK.—At a distance of eight miles from Oxford, in a well-wooded park, stands the mansion of Sir Henry Dashwood. The great hall is striking and lofty, and has in it an alcove and niches, with classical figures; over the marble chimney is a panel 5 or 6 feet square, in the best style of the master, and worth a long pilgrimage to see; it is nearly in its virgin state, and quite capable of being recovered and brought back from its present dark state to the rich golden tone of the carvings in the Cedar Chapel at Chatsworth. On the grand staircase, in rather a dark corner, high up, is a second Gibbon panel, the subject of which is a basket of flowers and fruit, with side pendants, covering a space of about 5 feet by 4 feet. The two panels are the largest and finest I have yet seen.

QUEEN'S COLLEGE.—The upper or great Library, contains some interesting carvings in Norway oak, a soft quick growing timber. The apartment is 150 feet long, and contains twenty-two projecting presses; all the presses are enriched with carving in the manner of Gibbons. Four of the presses in the centre part of the gallery have raised shields and flower work with two pendants on most of them, but they do not seem right, for the light husks, peas and currants, are left unguarded and liable to be broken, as has been the case with many of them, and the character is unsuitable for ornament so much within reach of the hand. The perforated scroll and foliage doors of the manuscript presses, are coarse and even vulgar, the flowers are rank, and what should have been broad leafage, with its well defined outline, is combed over, and cut up into littleness.

BLENHEIM.—In one of the early guide books to Oxford and Blenheim, I found a reference to a grand carving by Gibbons in the state bed room, placed round a large mirror, and felt it was my duty to see it, and having asked permission, I made my way to the palace in a flutter of expectation, but found nothing but a very fine specimen of Chippendale work, and that gilt; thus foiled in my object, I took the opportunity of examining other objects of art. There are many very noble specimens of Chippendale's work in the large mirrors, the workmanship is most beautiful, but what it all means is a mystery. Such a strange mixture of scraggy birds, and flowers cut into shreds, pagodas and rustic waterfalls, all this fine workmanship employed to produce nothing but an incongruous whole of absurd objects: there is a leading line in all these works, indicating what the old carvers used to call the C and G style; because if you attempt to draw it, it will resolve into these two letters.

MANSION OF LORD GLENGALL.—There used to be in the possession of the late Earl in Upper Grosvenor Street, an unique carving by Gibbons, the subject of which was the Stoning of St. Stephen, with very many figures: the top and sides have a very simple fringed drapery, as if it were a curtain to be drawn over the tableau.

The CHAIRMAN (Mr. JOSEPH CLARKE, Vice-President) proposed a vote of thanks to Mr. Rogers for his interesting communication, and said he was sure that gentleman would be happy to answer any inquiries that might be put to him.

Mr. PENROSE, Fellow, wished to ask Mr. Rogers if he could tell him in how many instances he had found the insects to have injured carvings of this description, and also in how many instances he found that the lime-wood carvings had escaped the ravages of the worm. He might state, during the last few years he had examined with great care and minuteness the whole of the carvings in

St. Paul's Cathedral, and he had the satisfaction of saying that he scarcely found a vestige of the attack of insects upon them. At the same time, he was aware of instances—among others, that of Gatton Park, near Reigate—where the insects had done extreme damage to the lime-wood carvings. He would also like to hear from Mr. Rogers whether he considered that carving was of the Gibbons school.

Mr. ROGERS said he believed a portion of the carvings referred to by Mr. Penrose was brought from Ditton Park. He was greatly and agreeably surprised—contrary to his expectations—to find the carvings in St. Paul's in so good a state of preservation, and so free from the attacks of insects; but such was undoubtedly the fact. How it was so he was not able to say.

Mr. PENROSE asked whether the portions which had sustained so much injury were those which were covered with paint or varnish. [Mr. ROGERS replied that they had not been painted.] He (Mr. Penrose) remarked that allusion had been made to a very beautiful specimen of the intertwined stall carving at Chatsworth. He had not seen that, but in his opinion the Lord Mayor's stall and those of the Bishops in St. Paul's were amongst the finest examples of that description of work extant. [The CHAIRMAN asked if that work in St. Paul's had been carefully examined.] Mr. Penrose replied that it had, and it was in a very good state of preservation. Some portions had been broken by violence, but the state of preservation was marvellous.

Mr. O. HANSARD, in reference to the statement in the paper, that carvings which had become blackened by time could be restored to nearly their pristine beauty, would be glad if Mr. Rogers would favour them with his experience with regard to the method of cleaning under those circumstances. That gentleman had also, probably, had some experience in the removal of paint from carvings; and if so, he was sure the meeting would be glad to be informed as to the best means of restoring old carvings which had been painted over to something like their former condition.

Mr. ROGERS observed that it was a difficult process. He could shew them a piece of carving by Gibbons; it had been thickly covered with paint, front and back. It was not possible to scour and wash the paint off in the ordinary way. It order to remove the paint, it must be eaten off; and for that purpose he made a trough large enough to hold the carving, and to admit of its being covered over with sawdust, which would be saturated with an alkaline solution of a strength varying according to the circumstances of the carving to be treated. By allowing it to remain in that state for a few days the whole of the paint would be eaten off. That was the only method of treatment he was aware of without the risk of breaking. With reference to the restoration of carvings which had not been painted, but had become blackened, in such cases scouring must be resorted to; but it required to be done by the careful hand of an experienced man. They knew that scouring either with strong or weak alkali or ammonia would raise the grain of the wood; nor could they sand-paper it over, to get the raised grain of the wood off: but a number of little tools were required, the ends of which were dipped into a little glue, to which powdered glass would affix itself, and thus make a sand paper at the end of the stick. In that way the burrs which were formed upon the wood by moisture could be removed from the delicate parts of the carving: but this likewise required to be done by an experienced hand. That was the method he had adopted at Chatsworth and elsewhere.

Mr. HISCOCKS, Fellow, remarked, that the quality of wood which was most subject to the ravages of the worm was a very important question, especially as regarded the old fashioned plan of binding books with wooden covers, of which there were specimens in the Archbishop's Palace at Lambeth, all of which he believed had suffered very severely from the ravages of wood insects. Some remarks had been made in the paper with reference to deal wood used in carvings, and he should be glad to be informed whether Mr. Rogers found that the ravages of the worm were greater in deal wood than in lime wood.

Mr. **Rogers** replied, that the lime wood appeared to be most susceptible to the ravages of the insects, and cedar was the least susceptible of all wood.

Mr. **Hiscocks** would be glad to know, whether in Mr. Rogers' experience, the painting or staining of the carvings preserved them in any way from the ravages of the worm.

Mr. **Rogers** considered painting was fatal to the preservation of the carvings.

Mr. **Jennings**, Fellow, remarked, that reference had been made to the use of lime, and oak and deal in carvings: he would ask whether there used not to be a good deal of pear tree carving at one time, and further, whether excepting as regarded the labour of carving hard woods, there was any reason why those woods should not be used for the purpose: was there anything beyond the difficulty of working them, which rendered such wood as box objectionable for the purpose? Because marble and stone were carved in an elaborate manner, taking into account their lasting qualities as well as the exquisite finish which those materials admitted of.

Mr. **Hansard**, presumed Mr. Rogers' remarks with regard to painting, applied only to the preservation of the carving in its original state, and not as a preservation after the attacks of the insects had commenced. He knew of cases where painting had been resorted to under those circumstances, which was of no benefit at all. He presumed the painting only applied to cases in which the worm had not entered the wood.

Mr. **Rogers** remarked, that at Trinity College, the painting was adopted with the idea that it would prevent the further ravages of the insects after they had entered.

Mr. **Hiscocks** further remarked, that he presumed Mr. Rogers in some cases employed the process of injecting the wood with corrosive sublimate, or something analogous to it, as a preservation against further ravages.

Mr. **Rogers** replied, that the method referred to was one which he had thought of, and in some cases proposed: but there was difficulty in the use of corrosive sublimate owing to the dark colour which was given to the wood by the metal contained in the sublimate. Professor Brand of the Royal Institution had suggested a liquid—the name of which he could not call to mind at the moment—which would have the same effect as corrosive sublimate without discolouring the wood to which it was applied, and was altogether better for the purpose than corrosive sublimate.

The vote of thanks to Mr. Rogers was passed with great cordiality.

DISCUSSION ON THE PAPER READ BY E. NASH, FELLOW—"REMARKS UPON FAILURES IN CONSTRUCTION."

(Adjourned from 8th April, 1867.)

The Chairman, Mr. Charles Barry, Vice-President, said, that the gentlemen who were present at the reading of a paper on this subject by Mr. Edwin Nash, on the 8th of April, would be aware that the discussion of it was adjourned till a future occasion. By dividing the evening, the opportunity was now afforded for taking up this subject, which he was sure would prove of practical interest, as the preceding one had been on a question relating to art. He begged to call upon Mr. White to open the discussion.

Mr. W. White, Fellow, said he had been asked by his friend Mr. Nash to open the discussion, inasmuch as he had brought with him an illustration of a case in point—viz., that of the failure of the pillars of a church some years since. He regretted that he had not the privilege of hearing the paper read; but from the admirable way in which the transactions of the Institute were now published and deliveréd to the members, he had had the opportunity of reading the paper. Still he had not been able to arrange the remarks which he proposed to make, and this must be his apology for any absence of order in them. He wished to bring before the meeting an instance of failure, in spite of what Mr. Nash had so well put as to the reserve which people felt in displaying their own faults or misfortunes, whichever they might be; but in a case where important structural questions were involved, one might well sacrifice personal feeling a little for the good of others. The point to which he wished to call attention was the failure of the nave pillars of the church at Lyndhurst seven or eight years ago. Exhibiting an interior view of the building, Mr. White went on to remark that it would be seen that the arcade was supported on chamfered brick pillars, surrounded with small slate shafts. Those brick pillars were only 14 inches square, and some might say no wonder they failed, being of so small dimensions. But he had surrounded them with slate shafts, which he knew would so distribute the pressure as to make them substantial, if properly constructed. In the drawing it would be seen that the pillars were divided in their height by a band of stone, connecting the slate shafts together, and thus distributing the pressure. Now, in the construction, those slate shafts were not put in when the weight came on the pillar, and therefore the pillar did prove unequal to the weight thrown upon it; and one of the pillars, yielded in the beginning of December, 1856, before the centres were fully struck. There was a crack vertically upon the four sides of the stone band to the whole width of the band, shewing its fracture into four pieces, and, *from this*, the fracture began gradually to extend to the brickwork also. That band was formed of Bath stone, only 6 inches thick. There was, of course, great pressure in proportion to its thickness upon the heart of the stone, entirely unrelieved in its outer bearings, the joints being kept free on the outside to prevent flushing. He would now read to them a letter which he received on the 6th of February, 1860, from the Clerk of Works respecting this failure:—

"I beg most respectfully to inform you that I have this day struck four centres of the nave arcades, viz., two on the south side and two on the north side. The pier north-west of the nave (with the four slate columns fixed) has now the whole of its weight. I have the wedges of the remaining four centres slackened, and intend removing them to-morrow. I will write again to-morrow evening, so that you may know the result. I will carefully watch the pier, and am prepared should any fracture take place."

Three days subsequently he received the following letter from the builder:—

"The nave piers in two instances have given out, and are not equal to carry the weight. Considering that the centres are not yet struck or the tiles put on the aisle roof, which will also increase the weight, it seems to be advisable to resort to some means to increase the strength of them; and we fear that all the piers must come out, and an iron shaft be worked up in them, or some other arrangement which you might approve. Shores have been put up to carry the weight, and no immediate danger is to be apprehended. At the same time, no time should be lost in taking steps to effectually prevent the chance of its going any further."

Now, upon receipt of that, as it might be supposed, he (Mr. White) went down and made a further careful examination of the work; but he had already, after his first visit, made calculations from such standard works as he had at hand as to what the bearing weight ought to be—that was to say, whether the pillars ought properly to support the superincumbent weight or not. He found, on calculation, the whole weight to be carried was $16\frac{3}{4}$ or 17 tons. He then took into account the pressure of wind upon the surface of the roof, which of course was considerable, though there might be also to some small extent a counteracting pressure upon the other side; and he found that when constructed, with the shafts, this pillar ought to carry at least 60 or 70 tons. The actual weight to come upon it was only one-third of that, which was the usually recognised standard for safe construction. He would remark that, in making the calculation, he consulted, amongst others, the formula of Telford, which gave, as the bearing weight of a brick pillar 12 inches square, 320,000 lbs., or equal to nearly 150 tons. This, again, plainly shewed the failure to be in the stone, not in the brickwork. The necessity of cast-iron pillars was strongly urged upon him, but he had written the following letter to the Vicar, after maturing his calculations:—

"I have carefully calculated the strength of the brick pillars. I find that, according to the lowest ordinary computation, common bricks ought to carry the weight well. With good hard strong red bricks, therefore, there cannot be the slightest possible fear, for this is without reckoning the shafts, which will almost double the strength. The banding of Bath stone is, however, under strength *without the shafts.* The shafts would make it strong enough if all had their proper bearing."

Then there was a sentence relating to another item in the base of the south pier of the chancel arch, which he would not refer to here, because that was a secondary thing, arising from other circumstances:—

"I have therefore no hesitation in deciding upon bricks, if good can be got, for the pillars; but it will be well to have a Portland or other hard stone for the banding course and the upper base. I should be very sorry to sacrifice the bricks, both on account of the design and general treatment, and of the needless expense which other material would entail."

But, apart from these considerations, and apart from the objectionable *idea* of such a mode of dealing with it, he felt that, if with this construction a cast-iron pillar were put up to carry the weight to be cased with an ornamental covering of bricks, it would stultify his own position as to the original construction, if properly carried out; and this position he felt to be strong and justifiable. The result was, that each of these shafts, one at a time, was taken out. He used some hard-pressed Staffordshire bricks, and a six-inch Portland band, in lieu of the Bath, was introduced in the middle of the pillar. This carried everything entirely, without the slate shafts which were put in afterwards. Here were the instructions which he sent down for the work:—

"The best-selected Portland to be used for bands, projecting $2\frac{1}{2}$ inches (*i. e.* beyond slate shafts), and chamfered. Peake's bricks for the pillars, and the shafts to be bedded top and bottom with 5 lb. lead and a thickness of felt."

This banding had since been carved, and everything proved to be quite satisfactory.

He would presently refer to the base of the south pier of the chancel arch, which was also crushed. But first he must exhibit drawings of plan and elevation of the pillars and capitals already treated of. Mr. White remarked that these showed more clearly the relative proportions of the thickness of the shaft with the height of the pillar and arch, &c.* He would also direct attention to the transverse sections of the church, one looking east and the other west; and also to the longitudinal section, which was of the chief importance. The plan of the foundation was also shown.

He would here say that this church was one of those cases in which his instructions were, "Now, plan a church: do not stick too much at expense; let us have a good, handsome church." He accordingly prepared most of the drawings for a handsome church. The intention was to do a bit at a time; but when they came to carry it out, they found it necessary to cut down a contemplated expenditure of £6000. to a little more than £2000. to begin with, and yet to provide the requisite accommodation. The consequence was, that they were put to all sorts of temporary expedients for carrying on the work; as, for instance, putting in common brick arches to receive stone windows eventually. Many of the windows had been put in during the progress of the work; but one of the chief consequences of that mode of proceeding was, that they could not in any way attempt to touch the south chancel aisle, which when rebuilt would afford a secure abutment for the chancel arch. But this pier was built against the old part (which has, however, since been rebuilt), and having an insecure abutment, the steps taken to secure it not being sufficient, the base of that pier was almost crushed by a slight subsidence. This base was in like manner taken out and renewed in Portland stone, and the upper part made thoroughly secure by means of wooden shores, which remained till the rebuilding of that portion a few years afterwards.

He thought that was all he had to say on that point, but he would also make a remark or two upon another subject, though this was one not of failure but only of construction. A year or two previously to that he had carried an arcade upon 9-inch brick pillars with perfect security and success. Perhaps the question would be asked, what was the good of cutting things so fine? Some people would say that a church ought not to be too cheaply built. He himself maintained, too, that it ought not. He considered no amount was too great to spend upon a church: but when it came to be a question of a church or no church, or the place left for eight or ten years, as he had known to be the case in impoverished districts, from the people not having the money to lay out as they wished to do, he thought a cheap church was in some instances almost indispensable.†

Another case he wished to call attention to was with reference to the construction of a roof, some 60 ft. in length, upon 12 in. walls 9 or 10 ft. high. He might state this was for a building for which a builder's plan had been already made and an estimate given in. It was to have been built of the same size—and in fact with 9 in. walls instead of 12 in.—and now it was to be built for the same sum as was estimated for by the man who furnished that plan. And he (Mr. White) undertook to put it in a little better form. He made the roof with the principal rafters coming down upon a sill piece, and a corbel coming on to a bracket down the wall 5 ft. or so; a collar, a king, and an iron tie, running from the foot of the principals to the collar. The span was about 18 ft. Now, on one side there was a chimney which formed a complete buttress; but on the other side, the wall at top had gone out several inches. He was satisfied that one element of weakness lay in not having a strut from that tie up to the principal rafter. In this case certainly the material was cut to the lowest capacity, to meet the circumstances of the case; and had there been a little more money, it need not have been cut so fine. Whether it was justifiable or not, was another question. He would not enter into this, but in answer to Mr. Nash's call he had come forward with these facts, which had been instructive to himself, as they might now be to others; and, he could only add, they were facts to which the meeting were welcome.

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* The dimensions are as follows:—Space of nave, about 24½ ft.; pillars, 14 ft. centre to centre (transept ditto 18 ft.); height of pillar with cap and base, 10 ft. 6 + arch, 14 ft. + wall, 4 ft. 6 = 29 ft. to wall plate; walls, 1 ft 11.

† From remarks subsequently made, it is needful to enter the strongest protest against this being interpreted to imply *any* justification of an architect's committing himself to such a flimsy or faulty mode of construction as shall shew even signs of insecurity. In both these instances the aim was to secure, in the design, an effect of certain lightness of construction,—such of course as should be perfectly consistent with security,—and the result of that construction (apart from the introduction of a piece of indifferent Bath stone for good Portland, and the postponement of part of the work necessary to the distribution of its pressure) not only justified that aim, but proved a complete success. Insufficient material, or inefficient construction, through lack of means, may be a valid "reason" for a failure, though it can be but a very lame "excuse."

Mr. EDWARD HALL, Visitor, called attention to a failure which took place in the roof of the original Croydon Railway Station at London Bridge, and, as far as he recollected, it was a most important case of failure, inasmuch as that roof was an illustration of Tredgold's carpentery. Last time he saw it, it did not appear to be in use, but the tie beam, which was a very extraordinary one, was then shored up.

The CHAIRMAN asked whether that was not altered at the time the London and Brighton Company changed the station to the high level. Whether new piers were put in he could not say; but he had noticed the fact stated by Mr. Hall. It was a shed of wide span and timber roof.

Mr. T. ROGER SMITH, Fellow, remarked, that the roof mentioned as having been shored up, was not the original roof of Tredgold, but was one which was put up about ten years ago, a queen-post roof, of which he had numerous drawings in his possession. It was a timber roof of 90 feet span, and the trusses were nearly 20 feet apart; and to the circumstance of so large a span being attempted in timber framing, which was always liable to shrink, added to the trusses being so far apart, he believed the fact of its failure was attributable. It was, however, a good instance of a fairly constructed roof which had failed from having attempted too much. [The CHAIRMAN said, he believed the piers were altered a good deal.] Mr. Smith thought that was the case. He was not aware of any failure in the walls.*

Mr. JOHN P. SEDDON, Honorary Secretary, said, in Rochester Cathedral he had noticed the

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* The roof in question spans that part of the South Eastern Railway terminus at London Bridge now known as the low-level platforms. It is a timber roof of a single span, and was erected about the year 1850, shortly after the fall of the roof at the Bricklayers' Arms station. That roof had partly rested on columns intermediate between the external walls, and one of these receiving a severe shock, which fractured or overturned it, the portion of roof immediately supported by it fell, and dragged the adjoining column after it, and so on till, bit after bit, the whole had fallen to the ground. In consequence of this disaster it was determined to have no intermediate supports at London Bridge. The clear span between the walls is 92 feet. The trusses are queen bolt trusses; and having measured one of them before it was put into its place, I can furnish the scantlings, which are as follows:—

	′		″
Principals	9	×	12
Tie-beams (each scarfed at the centre)	9	×	15
Collar	9	×	12
Braces	9	×	9
Purlins	11	×	7
Iron queen rods, and one central rod intermediate between them, circular			1¾
Iron rod intermediate between queen rod and wall, circular			1½
Wall plate	6	×	12

Trusses apart (from centre to centre) 19 ft. 9 in.

The principal rafter is held down at its feet by two straps, which also embrace a timber 9′ × 12″, and about 11 feet long, fixed immediately under the tie-beam.

This roof has partially failed; and to afford support to it two stout posts, placed 10 feet apart (5 feet each side of the central line), on solid bearings, have been introduced under each tie-beam. The most obvious defects of the roof, besides the lightness of the scantlings, as compared with the span, are, the extreme distance apart of the trusses, the want of a greater number of braces in the truss, the unsatisfactory placing of the purlins with relation to the braces, and the imperfection of the mode of securing the feet of the principals to the tie-beam.

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following curious circumstance. The triforium of the nave consisted of an outer and inner series of small arches, resting upon columns, between and connecting which were transverse arches thrown across from column to column without the slightest tie or abutment, and the weight of the superstructure had dislocated them to a serious extent, in many cases forcing the columns to lean outwards, and the stability of the structure appeared to be much endangered through this extraordinary want of foresight in the original construction, and, in his opinion, the critical condition which some of the columns were in at present required immediate attention.

Mr. OCTAVIUS HANSARD, Fellow, suggested that Mr. Seddon might be able to give them some information with regard to the extraordinary thrust in Yarmouth Church, which had thrown out the south wall of the south aisle to the nave so much.

Mr. J. P. SEDDON, Hon. Sec., said, that this had been caused by the decay of its roof, which he did not believe was the original one at all, as it was a weak and badly constructed roof to cover so great a width; for the spacious aisles of the church were no less than 40 feet, and had but moderate abutments in the shape of buttresses. He had no doubt that the original roof was of far better construction, with proper ties, but had been replaced at a comparatively modern period with the present one, which, though of oak, had never been well constructed, and consisted simply of couples of rafters, united by diagonal braces, and a collar crossing them as a species of tie, but from being placed so high, it had little use for that purpose, and had now become decayed, and the pins connecting the timbers loose. It was a similar cause which had thrown out the walls of half the churches in the country, and rendered necessary their reconstruction or restoration at the present day.

Mr. THOMAS MORRIS, Associate, remarked, that the diagonal pieces to which Mr. Seddon alluded were used as struts, and not as ties, which the Mediæval architects never used; they considered the walls were sufficiently strong, and therefore built the roof upon them.

Mr. SEDDON said, that he could not agree with Mr. Morris as to Mediæval architects not using ties. Occasional ties to such roofs were often put across from wall-plate to wall-plate, independently, as it were of the roofs, but still to counteract their thrust, and in later times these had inconsiderately been wholly or partially removed, to the detriment of the structure. He (Mr. Seddon) knew of many such ties existing, which were evidently original from the character of their detail.

Mr. CHARLES FOWLER, Jun., Fellow, remarked that failures had been experienced in respect of a material to which no allusion had as yet been made. That was concrete. They had been told on good authority, the result of careful experiments, that concrete does not expand in setting. He had no doubt Professor Hayter Lewis conducted his experiments with great care, and that the observations of them were noted with equal attention; but he (Mr. Fowler) would mention one or two instances where the results seemed to have been deficient. One was an instance in which very thin concrete was used in small quantities to form the base for laying an asphalte floor. Many present would recollect the flooring in the Byzantine Court at the Crystal Palace, and the wavy surface that it presented. That floor was formed with joists considerably above the level of the ground, and in order to make a base for this ornamental asphalte floor, the space between the joists was filled in with concrete to a little above them; and as the work was done in a hurry, he had no doubt the floor was laid before the concrete had properly set, and the result was it blistered. In another instance a similar thing occurred. In a slate gutter, forming the upper member of a brick cornice, the two sides were grooved into the bottom, and at intervals there were slate ties dropped in, and a capping grooved on to the front. The same method of construction had been used in buildings erected many years before, and had stood well. In this instance an attempt was made to give a fall to the gutter by putting in a little fine concrete, tapering from nothing to more than three inches in the thickest part; and on this—perhaps rather too soon—asphalte, half an inch thick, was laid to form the bottom of the gutter. Within a month or two after the gutter was finished the concrete was found to have expanded with strength enough to crack the slate ties, and the whole thing gave way. To remedy this the concrete was taken out, and the bottom of the gutter left square. These two instances of the use of concrete in small quantities occurred to him, and he might observe, that the small quantity used and the pure quality of the concrete were perhaps the causes of the failure. There was a large proportion of lime in the concrete. [A MEMBER: Was there any cement?] It was nothing but a fine concrete. He thought the quantity of lime ordinarily used with concrete might not produce expansion, though used in the proportion that was done in the cases he referred to, it might have that effect; but in no case did he think the use of concrete for such purposes was perfectly safe, unless it was allowed to remain a considerable time before any superstratum was put upon it. In reply to inquiries, Mr. Fowler stated he did not know what description of lime was used in the Crystal Palace floor, but in the other case the ordinary grey lime was used.

Mr. C. F. HAYWARD, Fellow, said, in making out the list of failures, he would refer to the use of bond timber, which was most fatal to all permanency in construction. If any quantity of wooden plates and bond timber were used in the walls of any building, it must eventually tumble down of its own accord, if it were not otherwise destroyed from any of the other causes, and in cases of fire it was peculiarly dangerous. In all buildings of his own, he made a point of not carrying the joists upon plates built in the wall, but to do away with plates, corbelled out the walls and inserted the joists without plates, in order to avoid having any of them in the building. One cause of failure not touched upon in the discussion, and one which would occupy too much time, was the decay of iron structures from the continual wasting away of the material. He had an opportunity of noticing the dome of the Custom House in Dublin during its repairs a few years ago—which, although constructed of good Portland or similar stone, threatened destruction, owing to the rusting away of the iron banding which had been built into the circumscribed wall of that portion of the building. He thought some very serious questions would one day arise with respect to the great iron girder bridges of railways, when they began to get a little old. It seemed to him before very long they would have some great failures or heavy reconstructions of these railway bridges, for it was perfectly evident that they were wasting away, notwithstanding all the painting—which, indeed, hardly lessened the evil—as witness the tons of metal scraped away from the Menai and Conway tubes every year. Unless they repaired them extensively (and in these bridges, he believed, special opportunities were afforded for doing this), by adding new plates—unless continual reconstruction was carried on—he feared that accidents would happen to those and all similar large iron structures.

Mr. HISCOCKS, Fellow, observed, that when, as Mr. White had said, they were called upon to cut down the estimates to so low a figure, they were put to their wit's ends to know how they could afford material for the proper construction of the building. The question was, what could be done under such circumstances? He thought in this respect they should take the example of their forefathers, who, if they were not able to build the whole of a church at one time, built what they did well. No doubt, an architect often imperilled his reputation in falling in with the views of his employers, and that was a temptation to which young architects were liable, and not they alone, but their seniors in the profession; but the senior members, having more experience, would avoid it: he would decide if he could not do it safely, he would not do it at all.* It was the fashion at the present day to build churches without steeples, and there was no discredit in that. If they could not build a church without risking their reputation with regard to general construction, it was better to remonstrate and decline the work altogether, or it might be better to build half, or even a less portion of the church, and when that was done, it would be a stimulus to the parishioners to subscribe more liberally when they saw the difficulty the architect was placed in. He happened to know the church which Mr. White had referred to, and he had a great regard for it.

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* The epithet "church work," used to be applied to work constructed in the best possible manner, but, he feared it would lose its charm as applied to churches in this utilitarian age.

Mr. JOSEPH JENNINGS, Fellow, said he would offer a few observations on this subject, though he had only read the paper, without the advantage of seeing the diagrams. With reference to risks of failure, it was important that everybody should anticipate any probable causes which might occasion failure in the works they undertook. This was particularly the case in London, especially in connection with foundations. It was stated in the paper that they could have no better foundation than chalk. No doubt; but it was seldom they were able to build upon chalk, and the only other really safe foundation was either rock or concrete. But they could not always go to the expense of putting in a concrete foundation when there appeared to be a good foundation without it. A large portion of the failures in London he had seen occurred in cases where people built upon gravel which appeared good. No architect would cut into and lower than what appeared a good foundation; and yet he had seen, in very short intervals of distance, a great difference in the depth of the bed of gravel, varying as much as from 6 feet to 6 inches. It must, therefore, be to a great extent a matter of judgment what they might expect. He strongly advised people not to build into that gravel without taking borings at moderate distances, but not in the line of the vaults, to ascertain the uniformity of the thickness of the bed; and even then there would be some risk of failure. Another cause of failure, not sufficiently mentioned, was from a layer of sand not being a horizontal layer. He had known an instance where a wall slid which had as much as 10 feet thickness of concrete under it, the ground having been taken out, and the concrete being all below the surface. No amount of precaution could have prevented that. He had no doubt the case was, there was a bed of sand lying below the surface of London clay. In the country he met with another instance of failure which arose from the use of sand stone from a new quarry, which crushed. This shewed the necessity of testing stone. The stone, judged by appearance only, should have borne double the weight without crushing. Several other causes of failure had not been mentioned, which were matters of interest, and these had been from defective workmanship, for which the architect was not liable. No doubt some of the members present were aware of the failure which took place in Mincing Lane. In that case he believed the late Mr. Joseph Woods was the architect: he (Mr. Woods) retired from the profession, for it was not worth while incurring the expense he was put to in restoring and reinstating admirable constructions which failed from small faults. He would make one further observation on the question which had been raised, whether they should undertake to build at small expense. He thought the greatest skill of the architect was to produce the largest quantity of work possible with the money committed to him, if the object was merely mercantile; but if he constructed a building so cheaply that it would not stand for the purpose for which it was designed, he showed himself incompetent to carry out the work with which he was entrusted. The great thing was to decide how cheaply he could build to produce the work which was required; but they must bear in mind, in trading purposes, it was sometimes a question whether they might not more advantageously build several times over than build expensively at first. In the country it was the cheapest plan to build barns and other farm buildings inexpensively, and to build again when they were worn out, as the interest of the money which would otherwise have to be expended in building such structures substantially is a great consideration. In a commercial point of view, such a course might often prove the most economical one; and circumstances may require such alterations in the buildings themselves, in course of even a short time, as to make that mode of proceeding advantageous.

Mr. Octavius Hansard, Fellow, protested against the doctrine laid down by Mr. Jennings, of erecting buildings in a slight and flimsy manner, and he should be sorry that it should go forth to the world—coming from one of the older Fellows of the Institute—as a principle that was accepted in that room. If that theory were carried out, some of them might have cause to grieve, if they had a long life; they would regret to see the thin and flimsy constructions; much more would those who came after them regret that in the present age we had not built as our forefathers had done, when they saw some of the fine old roofs in barns, &c., that would be yet in existence, and which Mr. Jennings seemed disposed to cast to the winds. He hoped they would never follow the recommendation of thin and flimsy buildings simply because they were cheap.

Mr. Thomas Morris, Associate, remarked, that he had perused Mr. Nash's paper with great satisfaction, because of the importance it justly attached to professional experience. A number of illustrations were given, which enabled them to compare the different modes of working under different circumstances. There was the paucity of materials in the steam-boat pier: the wonderful superfluity in the Corporation work at Billingsgate; and perhaps, the happy medium in the embankment to the Houses of Parliament. He did not concur in the theory of deep foundations in soft soil as opposed to foundations widely spread. In the Nelson Column, for example, he did not think the same results would have been obtained by great depth of foundation as was done by spreading them to a width nearly equal to half the height of the column. There could be no doubt that when weights were accumulated on points, as in the piers of a church, the rational mode was to spread the foundations as uniformly as possible round the centre; but that was not practicable with the piers of a bridge: there it was necessary that the spread should be lateral. He thought Mr. Nash had misunderstood the principle on which Mr. Hoskins proposed to carry inverts from one pier to the other. He (Mr. Morris) believed the object was to guard against the scour of the river, rather than to give support to the structure above by the inverted arch below. Something of this sort suggested itself to him several years ago, and he drew attention to it under the name of counter-pointing. With regard to inverts in house-building, where the walls consisted of piers and apertures, he thought it reasonable to carry the pressure of the piers over that part of the foundation which lay under the aperture, but it should be done by inverts of the same circular form, and not of the weak flat kind introduced at St. Thomas's Hospital, which seemed to bespeak failure from the first. The ample use of concrete had been a great advance in modern foundations, and so was the utter disuse of timber. Concrete had another advantage, that in large works it was not very easy to substitute any other material for it; but it was not so in small works. Some time ago he was introducing a lofty internal wall into an old building, and knowing the great weight of the brickwork in his plan, he prepared a base of concrete. He was present when the trench was excavated, and again when the footings were to be laid. Something occurred which caused a doubt in his mind, and he insisted upon having the trench re-opened, when he found that, instead of concrete, the most worthless rubbish had been put in, and dredged over with a little wetted lime, that caused a rising of steam. Now, if he had not happened to detect this piece of "scamping," no doubt the wall would have given way as soon as it got to any height. He thought that was tantamount, on the part of the builder, to an attempt to obtain money under false pretences. The accidental suspicion in this instance had unquestionably prevented a disagreeable consequence; and failures possibly occurred as frequently from a want of moral integrity on the part of the builders, as from want of skill on the part of architects. It might be said that the attempt he had mentioned could only be made by a person of no reputation, but he feared that such practices reached to men of higher grade. A builder of some eminence had lately said, it was the duty of the Clerk of the Works to see that the work was well done. But was it not the builder's duty to do it well? The man who could only be honest under the eye of a Clerk of the Works surely stood in no better moral position than one kept honest by the vigilance of the police.

Mr. C. **Fowler**, Jun., suggested that, with regard to the failure of the first tower at the Crystal Palace, which had reference to the question of concrete, Mr. Nash might be able to give the meeting some information. He believed the fact was, the concrete was considered to be imperfect, and after the tower had been carried up two-thirds of its height, it was taken down again, the foundations dug out, and a cement foundation laid with broken granite stone.

Mr. **White** would ask Mr. Nash whether he did not find that very thin concrete was almost sure to go, and also whether concrete made with fresh lime was not sure to blow?

Mr. **Edwin Nash**, Fellow, said, "The evening is too far spent to enable me to notice properly the observations that have been made, but I am pleased at Mr. White's useful illustration having been brought forward (and Mr. White deserves our warmest thanks for his magnanimity), and I had hoped that a description of many more cases would have been given, inasmuch as they would have been of great value to us as practical builders. The piers that Mr. White has described are a very good example indeed in connection with a point that I have rather harped upon in the paper, namely, the necessity of homogenity of material in the horizontal strata of piers or walls carrying great weights. The piers he has named had no homogenity, and in fact the brick centre ought first to have been allowed to feel the weight that it had to carry, and the small slate shafts should have been put in after that. This peculiar constructive defect has been a frequent one in buildings of the middle ages, and up to the present time, and I have observed many instances in which, where similarity of material does not extend horizontally through the body of the work, one of the two different sorts of material gives indications of distress. Roofs have not been even named in my paper, but the shed roof, alluded to by Mr. Hall, was a very good one of the simplest construction; it is figured in the appendix to Tredgold, and stood admirably for many years at the Brighton terminus, until interfered with by alterations there. [The roof that now exists is not the original one, having been subsequently put up in imitation of the earlier roof, but with slighter scantlings and inferior workmanship.] With regard to the expansion of concrete we know that it does expand before it has set, but not afterwards. Concrete used in little patches is not of much value, and the placing it upon a wood floor with the intention of its keeping a perfect surface is a misapplication of its use. The remarks as to the advisability of keeping wood bond out of walls have little force, because wood bond is the very bone and muscle of a weak building. I say of a weak building, where nevertheless it is the most objectionable, on account of its shrinkage and perishable nature. What has been said about iron structures is perfectly correct, and it will be seen that iron buildings are the most evanescent on the face of the earth. Mr. Morris will find that Professor Hosking did recommend inverts under the piers of large bridges [in his 'Practical Treatise on Bridge Building'], but a curved pavement under a bridge is a very different thing."

The **Chairman** congratulated the meeting on having passed, as he believed, a very pleasant evening in the discussion of a very practical and useful subject, and he thought it likely it would give rise to another paper on Construction next session. There were practical points which were highly interesting to the profession, and papers like this were very useful to them all; and he hoped the further discussions which might take place would not be less interesting than that which they had listened to this evening.

The meeting then adjourned.

A MEMOIR OF THE LATE SIR ROBERT SMIRKE, R.A., &c., Hon. Fellow.

By Edward Smirke, Esq., M.A., Vice-Warden of the Stannaries, &c.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, June 17th, 1867

David Brandon, F.S.A., Vice-President, in the Chair.

Mr. Chairman and Gentlemen,

I have to tender my thanks to you for permitting, and even encouraging me, to read before you a short Memoir of my brother, Sir Robert Smirke, for the use and information of this Institute. For this favour I can plead no claim whatever, nor any other qualification for the task save only the long, intimate, and confidential intercourse which subsisted between us. The task might better, and certainly more naturally, have devolved on another member of our family; but I have reason to believe it to be one from which he would, under the circumstances, desire to be relieved.

In the beginning of the year 1796, my brother Robert, being of the age of fifteen, was, by the advice and recommendation of Mr. George Dance, received as a pupil in the office of Mr. Soane, then engaged on works at the Bank of England. In July of that year he became also a student of the Royal Academy. For reasons which I do not know, but can only conjecture, he was removed from Mr. Soane's office after the lapse of less than twelve months, with his father's concurrence and approbation. That his son took a lively interest in his architectural pursuits during that time, is evident from his contemporary letters now in my hands and addressed to his father; but any one having the slightest acquaintance with Mr. Soane's works, especially at the Bank and in the present Courts of Justice at Westminster, will have little difficulty in concluding that, although my brother probably received some benefit from his experience of practical work in that office, he certainly retained afterwards no trace of the characteristic architectural peculiarities, whether for good or otherwise, of his first teacher.

In December, 1796, he obtained a medal of the Royal Academy for architectural drawing. In 1797 he received a like medal of the Society of Arts; and in 1799, the gold medal of the Royal Academy for Design.

In 1801, my brother, having attained the age of twenty, went abroad with his elder brother, Richard, and attempted to visit Paris by way of Holland, hoping to pass for Americans, and to pay a sort of surreptitious visit to that city, where some of the great works of Italian art, the product of the cisalpine raids of Napoleon in Italy, were in course of accumulation. The excursion, however, was a failure, and my brother escaped (not without some difficulty) a permanent detention in France.

In 1802, the peace of Amiens opened the continent again to English visitors, and my brother found himself on his way to Paris, with every prospect of an extension of his tour to the South of France and Italy. During the whole of this excursion, and indeed the whole of my brother's absence, a constant and very detailed correspondence between him and his father, attests his devotion to the great objects of his visit: namely, professional improvement and experience.

In the course of the year 1803, writing from Pisa, he announced his earnest desire to extend his tour forthwith to Greece. My brother had already made himself pretty well acquainted with the publications of Stuart, Chandler, Le Roy, and others, who had before visited and described many of the remains of Greek art, and he was, therefore, well prepared to turn to account this extension of his tour. Lord Elgin had, about this time, arrived at Rome on his way to Constantinople with a corps of Italian and Russian (or Crimean) co-adjutors, and had already earned celebrity for the successful prosecution of those Athenian and other researches which, eventually, secured to this country those inestimable treasures of art with which we are all now familiar.

These researches were known to my brother, but it was not known to me until I lately examined his journal and papers, that overtures had been before made to his elder brother and himself (I believe before he left England), on the part of Lord Elgin, with a view to enlist them in his service.

It is well known that His Lordship had much difficulty in securing competent aid to carry out his original intention, which at first contemplated only the obtaining of careful architectural drawings, casts, and copies of the most important remains of Greek sculpture and architecture. The terms of this negotiation are not specified by my brother, but only noticed as a matter that had gone off. The gentleman who was at last engaged to superintend the works carrying on at Athens on behalf of Lord Elgin, was Lusieri, a very accomplished Italian artist, whom my brother found still engaged in his Lordship's service, when he visited Greece.

It was an additional incentive to my brother's earnest wish to visit Greece, that he had the good fortune to meet with such amateurs of classic antiquity as Lord Aberdeen and Mr. W. R. Hamilton, who had both been engaged in like researches, though, of course, with immeasurably more effective means at their disposal for indulging in their tastes than my brother could ever hope to possess.

His utmost ambition was to visit the Peloponesus, Attica, and the adjacent islands, then known to be teeming with the crumbling relics of ancient art belonging to the most illustrious period of Greek culture. He and his young friend, William Walker, only prefigured to themselves a rough journey over a charming country, on foot or horseback, unincumbered by passports, or firmann, and with no other difficulties before them than those which health, youth, high spirits, and a good will, could overcome. When they landed in the Morea, they found themselves, to their great dismay, at the head of an escort of horse and foot, guides, and guards, to be paid, fed, and fee'd at their own costs, to the manifest detriment of their very slender financial arrangements.

Their stock of portable topographic information consisted of an edition of Pausanias, with the Greek and Latin text, and the memory of what they had learned before they started, or had picked up on their way. Occasional letters to a local consul afforded them their chief hope of assistance in difficulty, and letters of credit, that never got nearer to them than Naples, were their resource for supplies in a country overrun with insolent Turks, and of Albanians, who performed the double functions of soldiers and robbers, especially the last.

With such aids and companions these young men scrambled over the Morea from Patras to Tripolitza, Sparta, along the valleys of the Eurotas and Alpheus, Messene, Arcadia, Argolis, Corinth, and Epidaurus to Athens enchanted with the scenery, and well pleased to copy a fractured capital, or a mutilated inscription, with a Janissary, armed with a loaded musket, on each side to protect them, and an armoury of small arms, swords, &c., round their own belts. Whether this district of Southern Greece be now traversable without material risk or inconvenience since the expulsion of the Turks, I will not undertake to say, but I am informed that it cannot, even now, be regarded as a very safe or satisfactory excursion, at least to parties so little provided for it as the travellers of whom I am speaking.

At Athens the work of removal was still in progress, and my brother does not conceal his regret as he watched the rough removal of the bas-reliefs by crow-bars from the walls of the cell of the Parthenon, and could not help feeling it to be the signal for the annihilation of these interesting local monuments, though he is pleased with the prospect that they were destined for his own country, and that the exertions, which had been made by the French to secure them, would fail. Though he did not at first purpose to stay long there, he confesses that he never felt such interest at the sight of any of the most celebrated Roman works. "I wish," he says, "I could come day after day, and walk about these wonderful specimens of architecture." He is every where forcibly impressed with the simplicity and dignity of the great works which 2,000 years of decay and destruction had left behind; and the memory of those grand architectural features was ever after present in his mind, constantly counteracting the more popular inclination to superficial decoration, in which, I think, he was always disposed to indulge but sparingly in the exterior of his buildings.

On my brother's homeward voyage to Messina, he became apprised of the renewal of the continental war and threats of imminent invasion; and began in his letters to express a mournful apprehension that, on his return to England, he should have to resign himself to the disappointment of his visions of professional advancement, and to "put on a red coat and shoulder a gun" for the rest of his days.

His anticipations were only so far verified, that he and his two brothers and father were, on his return, enrolled in that defensive voluntary force which has, in our time, received so large a development; but, happily, his professional prospects, as we shall see, were in no degree impaired. It is worth notice, that he became the author of a small illustrated manual called—"A Review of a Battalion of Infantry"—on the drill of infantry, which continued in use in the Regular forces as late as 1840, and, I have heard, even to a still later date. His name was alone attached to it, but there is a family tradition that his father had some unavowed hand in it.

On his return from Greece he made a detailed examination and careful drawings of some of the architectural remains in the Island of Sicily, and he determined to visit the principal cities between Rome and Venice, so far as the hostile occupation of French troops would permit.

When at Rome, he found that his remittances had miscarried, and he resolved to return on foot with a young Italian to Naples, and to visit the buried cities of Campania, and, meantime, to trust (as he expressed himself in his letters) "to Providence and the highway" for the deficient funds, and "to live on bread and water" sooner than give up his visit to Pompeii. One of those resources, viz: the *highway*, was one to which he had, as a patient, become tolerably familiar in the mountain passes of the Morea.

In his way through the principal Italian cities the copious criticisms on them, in his letters, mention with satisfaction the works of Palladio; but he rarely speaks with much approval of what is usually termed the Italian, Mediæval Italian, or Gothic, so far, at least, as regards the architectural features of them. He remarks that "there is too much of a mixed style in these works, to be agreeable to me," and he refers to the prevalent practice of introducing, both outside and within, horizontal stripes of dark-coloured stone every two or three feet in height, which are carried through the columns, pilasters, and every thing, and which, as he remarks, "essentially injure the effect of the building." He even goes so far as to express his doubts whether the long stay of a student, in the presence of those examples, may not be as likely "to hurt as to improve him: for the eye may grow familiar with such practice, especially when associated with very superior work, till it ceases to be sensitive of its defects."

My brother's tour was prolonged by a stay of several months in those parts of the Tyrol and Germany, which were not under French occupation. In this part of his excursion, the visit to Berlin seems to have best pleased him. He returned to his own country and home early in 1805.

Among the first fruits of his return was the announcement of an illustrated work with "specimens of continental architecture." The first part consisted of coloured engravings of Italian buildings and interiors, which we may suppose to have been specimens of those which had been most consonant with his tastes at that time and in that country. The series, however, was soon discontinued. In fact, a year had not expired since his return, before he received the first and one of the most important of his professional commissions, viz., the erection of Lowther Castle in Westmoreland; a commission which he owed to the united recommendation of Sir George Beaumont, Bart., and Mr. George Dance. From that year, down to the time of his final retirement from all further professional engagements, it may be said with truth, that there never was any interruption in his continuous employment.

If I were to remind his surviving friends (of whom, I fear, there are now not many,) of his various professional works, even confining the number to works of a public character and to considerable private mansions both in England and Scotland, it might seem a somewhat ostentatious catalogue, and might wear an aspect of self-glorification, in which, if I knew him rightly, he would not have permitted himself, or wished his friends, to indulge.

An enumeration of this kind, extending over nearly fifty years, (for he may be said to have declined every new engagement after 1845), would not be very easy to make; accounts would have to be examined, and even buildings inspected, in order to distinguish mere reparations, or unimportant additions, from a building or mansion that was practically a new work. Perhaps, however, we may be able hereafter, to a certain extent, to accomplish this object.

His earliest employment on *public* works was in connexion with the Board of Trade, at the nomination of Lord Bathurst, in July, 1807, and on the new Mint in 1809. Eventually, he became one of the attached architects of the Board of Works upon the subdivison of the office on the decease of Mr. James Wyatt. Among the latest prominent works extant, in that character, were the General Post Office, the British Museum, and King's College, London.

Lowther, Eastnor, and Kinfauns (N. Britain) castles, are surviving and important examples of his domestic architecture on a princely scale. As to Courts of Justice, Council Houses, and the like, I am really unable at present to enumerate them, if I were disposed to do so. Nor would it be pertinent to this memoir to particularize those various buildings, on which my brother had to perform the less ostensible, but rather important and responsible, office, of upholding or reinstating the work of some less fortunate of his contemporaries, whose constructive character had suffered by the knavery or negligence of contractors. Among these I will merely remind you of the Custom House and Penitentiary. It was on occasions such as these (of which I could mention several others), that his friend, Mr. Croker, formerly Secretary of the Admiralty, was pleased to designate him as the "Dr. Bailey of architects," whose painful office it was to be attendant on the last hours of a sinking patient.

I believe that I am justified by the published writings, as well as private letters, of General Sir Charles Pasley and others, in attributing to Sir Robert, not indeed the first use or invention of concrete foundations in lieu or in aid of piles, but the habitual and systematic use of concrete in suitable situations to a far greater extent than had been theretofore applied in civil architecture. I have made this statement, *not* on his authority, or any claim of his own, for I find none. In fact, it was a sort of controversy on which his habitual disregard of assumption, or self-obtrusion, would have made him an impassive, unconcerned, bystander, rather than a party litigant.

About 1845, at the close of his general practice, Sir Robert was placed by Sir Robert Peel on the Commission for London Improvements, on which he attended for two or three years, but with a strong sense of his increasing inability to serve the public by any active exertions.

Let me venture to offer to the members of this Institute, which may fairly be taken to represent the highest development of recent architectural art, some observations on one or two of Sir Robert's earliest works, already referred to; and to offer them in no spirit of criticism, or invidious comparison, or of depreciation—sentiments which in your presence, I feel no title, or inclination, to indulge in.

Lowther Castle was the first great work which he undertook. Eastnor Castle was not much later in the series, and in both the Mediæval style of castellated architecture, utilized and modified for the purpose of convenient occupation by a nobleman of the 19th century, was deliberately adopted. Sir

Robert, therefore, cannot be quoted as an authority by those who consider Mediæval forms unsuitable to domestic architecture. These occupy two of the finest sites in England.

I need not remind you that when the first stone of Lowther was laid, the public taste had been but scantily educated by the careful study and delineation of the details and forms of the style usually called Gothic. The folio volumes of John Carter were known, and Mr. Britton had only just commenced his series of excellent drawings illustrative of English ecclesiastical architecture.

Since that time, a host of young architectural draftsmen, and other aspirants to ecclesiology, have arisen, who have laboured, and with great success, to familiarize—I had almost said to saturate—the public mind, clerical as well as lay, with detailed examples of our most notable fabrics of Mediæval design; but whatever had been done, especially in England, in that way, before the close of the last century, had been of such a character, that our present race of amateurs would have been well satisfied if it had been left *undone.*

Under the guidance of my brother's early and valued friend, Mr. Samuel Lysons, whose varied researches embraced the whole range of ancient and Mediæval art in England from the vestiges of Roman rule, included in his "Reliquiæ Britannico-Romanæ," to the sacred and civil architecture of the middle ages, comprised in the "Magna Britannia" and other monographs of local antiquities, it was impossible that my brother should be uninformed on these matters, or unacquainted with the earliest and best examples, although he was not, and could not well have been, provided with those superabundant materials which are now at the disposal of even an architectural tyro, who has never stirred out of his study. Among the engraved illustrations of those well known works of Lysons, you will find many proofs of my brother's early connexion with them, testified by very careful and correct drawings, from which the larger prints were engraved. Yet with all such drawbacks and such difficulties I venture to doubt whether, after the lapse of sixty years, the design and forms of those majestic masses of towers and terraces at Lowther and Eastnor, which overhang Ullswater, or crown the lesser heights of Malvern, have since been excelled in their dominant features.

I have already admitted that, so far as regards the Teuto-Roman Gothic in North Italy, my brother's experience (not perhaps a very mature one at the age of twenty-one), had not left an agreeable impression on his memory. He looked on it as a heterogeneous phase of art, though not unaccompanied in some remarkable instances with very striking effects, and very admirable decorative details:—how could it be otherwise, at a time when the arts of sculpture, colour, and architecture, were found so often concentrated in a single highly gifted genius!

Whether this opinion of Sir R. Smirke in 1803-4, has been since reversed or over-ruled, at least by those of his successors who appreciate the purity and beauty of Anglo-Gothic models, or admire the marvels of French and Flemish Mediæval genius, I know not; for though I occasionally meet with recent works, which, I presume, mean to represent "Italian Gothic" of the 14th or 15th century, I am imperfectly acquainted with the extent or success of the late attempts to naturalize it in this country.

Again, let me offer a few remarks on the late theatre at Covent Garden, erected by my brother on the site of the one burnt down in 1808.

On the application of John Philip Kemble and Mr. Harris, then proprietors, he was engaged to build a new one. From the papers before me I infer that he was left at liberty to adopt such design as he thought fit. The funds were considerable, and my brother turned to the fond recollection of his first architectural love, and determined to make the new building an occasion for realizing his early ideal of Athenian architecture and art, which we have seen exercising so strong an influence over him on his visit to Greece. The façade of the Propylæa, rather than those of the Dorian temples, appears to have been the more immediate idea in his mind's eye. The vast and severe simplicity of the Doric shaft, capital, and entablature, were, for the first time on a large scale, to be exemplified in this metropolis, in which draped statues, types of the dramatic art, were to occupy niches, while sculpture in the low relief, which he had so much admired in the Phidian cella and sculptures in the Acropolis, was to enrich the masonry of the surface. To these, the classical genius of Flaxman and the careful execution of Rossi were made contributory.

In the interior an upper saloon, appropriated in the original design to the circle of private boxes, with its ranges of Sienna marble pilasters and statues, recalled the internal taste and decorations of an Italian villa or palazzo; but this disappeared many years ago and lapsed into a disreputable appropriation.

The natural life of a theatre is generally a short, though it may be a cheerful, one. Its "little life" (as Prospero would have said), "is rounded with *a fire*." But that to which I refer survived its perils for fifty years, though, in the course of those years, much of the interior, and many of its important external features had undergone strange mutations for the worse before its final extinction in 1856; and nearly all the precautions against fire designed by the architect, so far as regarded the fabric, and counselled by the great chemist of the day, Sir Humphrey Davey, with reference to the more inflammable materials of scenery and drapery—had been removed and forgotten. The details of the original design now exist only on paper.

The correspondence on the occasion of this building between Mr. Kemble and my brother, is extant, and is full of entertaining matter, to which that great, and very accomplished, actor was the chief contributor. The work was at the time prodigiously eulogized and admired by the Hopes and Aberdeens of that day.

With the close of Sir Robert's professional life, this Memoir ought also to end. Any notice of his private life has no proper place here; and if I were to yield to my personal inclination to pourtray him in his domestic character of a very dutiful and affectionate son, and a brother to whom we were all attached, and from whom we never failed to receive constant proofs of kindness, my testimony would be of little worth. But a reference to some of those qualities, which certainly conduced to his success, will neither be inappropriate, nor fairly liable to the suspicion of fraternal partiality.

It was said by the biographer of an accomplished Roman, that a "man's moral habits are the mould of his character"—"sui cuique mores fingunt fortunam,"* a saying which I believe to be the origin of the motto adopted by a great architect, William of Wykeham, and expressed in his archaic phraseology—"*manners makyth man*." My brother was eminently the architect of his own fortune. We have seen that no difficulty, personal privation, or personal risk, ever discouraged him in the zealous and laborious pursuit of his adopted vocation. From the school, to which he was indebted for a very solid classical education, he turned into a wider world with an aptitude for assiduous labour which left no time idle on his hands. In 1796 he wrote to his father—"I am writing *alone* in the office [Mr. Soane's] at 8 p.m., and I send this to you to let you know how I am getting on here" [and then follows a long folio letter of three sides]. From the dawn of actual practice down to the final suspension of all his labours (1845), and his permanent retirement from it to his pleasant villa at Stanmore, he was daily up and at work long before any one else was stirring in the house.

Another habit, which also conduced to his satisfactory transaction of business, was the methodical and orderly manner in which all his arrangements were made.

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* Corn. Nepos., c. xi.

His remarkable equality of temper, and uniform moderation of language in oral intercourse, were known to all with whom he had relations of business. I imagine that it must have been a very difficult thing to provoke him, or to find the materials for a quarrel with him. I can undertake to say, that I do not recollect a single client, with whom he had important transactions of a professional kind, who did not in the result become his fast personal friend. I do not recollect, nor have I found in his most exact and methodical private accounts, the occurrence in a single instance of any difference or dispute between him and his employers in relation to his professional practice, or the settlement of his accounts, or any complaint on the old subject of estimates exceeded. In this respect I speak from the constant intercourse of some fifty years and upwards of my own life, and from the assurances of those who had habitual transactions with him both of a private and public nature. When the Office of Works was remodelled and his services dispensed with as an attached architect, Lord Melbourne personally told him that knighthood was conferred on him to testify that no ground of complaint or dissatisfaction existed personally against himself.

It is well-known that he never prepared designs for public works in competition with any of his professional brethren. It is true, that on two occasions, he was invited, at the instance of the Government, to prepare designs. The Houses of Parliament may be cited as an instance of this, where the design and execution were eventually intrusted to another gentleman, a most distinguished architect, in consequence of the subsequent adoption of the principle of competition by order of the House of Commons. On such occasions, my brother withdrew wholly from the arena;—not in dudgeon—but for reasons which will readily suggest themselves to those who may have themselves been placed in the like position.

With respect to architectural works, founded on special votes of the Commons, it seems probable that this sort of qualified commission will, at this day, be generally resorted to. In such cases it is not likely that gentlemen, who occupy the position in which Sir Robert Smirke then stood, will usually consider the terms of such a conditional engagement acceptable; for their time would be too valuable to tempt them to the possible loss of it. With others, and especially younger practitioners, the state of things is different, and the invitation may naturally and reasonably induce them to embark in an adventure that may perhaps terminate in a lucrative and creditable engagement. This principle of competition can, as we all know, plead very orthodox precedents in the best days of Italian art. We know that Cosmo designed to invite the emulation of all the sculptors of the academy to provide models of statues in competition for the Sacristy of Lorenzo: but we also know that he looked to one of the greatest of them all, then 80 years of age, to guide and direct him in his judgment, and thus the real difficulty was, in that case, surmounted;—namely, the selection of such judicial referees as may at once secure the public from a lamentable failure of judgment, and obtain for the competitors a fair, unbiassed, consideration of their claims. Whether the former of these objects has always been practically secured, at least in architectural works, is, I fear, still open to question. It must be obvious that, in *architectural* rivalry, even the most attractive designs and admirable drawings do not necessarily imply competent constructive ability to direct and superintend the execution of the work.

On the retirement of Sir Robert Smirke, he was gratified with the presentation of a marble bust, admirably executed by Campbell, as a testimonial by his various surviving pupils. Of this excellent portrait bust, I have laid on the table for your acceptance a very good photographic copy.

In 1853, this Institute honoured him with their gold medal, a testimony of respect which he greatly prized, as, indeed, he could hardly fail to do, when we look over the roll of names of those who have received this compliment.

When he permanently quitted London as a residence, he resigned the treasurership of the Royal Academy of Arts after holding it for thirty years and upwards. He was elected an Academician in

A.D. 1811, and had at all times been warmly devoted to its prosperity and interests. Feeling, too, that he was no longer able to render any material assistance to that body by participating in its duties, he tendered to the President and Council his resignation of the style and title of Academician, and Her Majesty notified to them her sanction of their acceptance of such resignation with an expression of "her full appreciation of the motives which actuated Sir Robert in tendering it."

I should mention that his willingness to take this step had been before expressed to Sir Charles Eastlake through your late President, Professor Cockerell, but in consequence of other arrangements then pending with a view to some permanent modification of the constitution of the Academy, my brother's intentions were not carried into effect.

Gentlemen,—the voluntary task which I have undertaken in memory of Sir Robert Smirke, and as an imperfect notice of his life and labours, must here close. I am sensible of the embarrassment which is inevitable when a biographical sketch, and especially that of a professional life, by a near relative, is attempted by one who, like myself, can lay claim to no critical or practical knowledge of that profession, or to any qualification beyond a sincere love of art, and the memory of many long years of sympathy and friendship with some of its most esteemed professors in various departments of it. If, in the course of this notice, I may appear to have formed too partial an opinion of his merits, I must pray you will have me excused. But most of all I should regret if I shall have had the misfortune to convey to any of my hearers an impression that Sir Robert was used to assume an air of critical superiority with regard to the works of his brother architects. Far from it. As for his own, he was really as little accustomed to talk of them, as he was to talk about himself, either for self-display or otherwise. Upon such an occasion and such a topic no one would have more willingly acquiesced in the judgment of the Spartan patriot, and in the words of our own poet, he would have said,

—— "Be the Spartan's epitaph on me,
Sparta has many a worthier son than he."

Mr. E. SMIRKE having thus concluded his Paper,

Professor DONALDSON said, he rose on that occasion as one of the senior members of the profession and of the Institute, to propose a vote of thanks to Mr. Smirke for the very interesting memoir he had just read. It was the memory of a great and good man—of one whom they must respect as their professional brother, and one whom they must respect also in regard to his personal character. There was no one to whom his own brothers could, or did look up to, better than himself for an example to themselves, and as to the course of conduct they should pursue both in private and in public life. Their friend Mr. Smirke had alluded to many interesting facts in connection with the early life of his late brother, particularly his visit to Athens; and he mentioned the names of Lord Elgin and Mr. W. R. Harrison, likewise that of that most interesting personage Sig. Luciani. Sir Robert Smirke knew him in the year 1802: he (Prof. Donaldson) recollected him in the year 1820, and he was now, he believed, still living, and was pursuing his art with the same interest, the same appreciation of tone and perceptions of harmony in the public buildings of Athens, to the study of which he had so long devoted himself: and he believed that most interesting collection of drawings which he executed were partly in the British Museum, and partly in the private collection of the late Lord Elgin. They were executed in an admirable manner, and were feeling transcripts of that which he had before his eyes. Their friend had alluded to the Peloponnesus as being more safe for travellers and explorers as compared with the period at which it was visited by his late brother. He (Prof. Donaldson) went there in 1820, and it was by no means safe then. His companions were Wolfe and Jenkins, and they were obliged to lie before the door of their bedroom with their arms ready, to prevent robbers from entering, and defending themselves if attacked.

But those perils did not deter them from prosecuting the studies on which they were bent. Their friend Mr. Smirke had alluded to a pamphlet written by his late brother on military matters. He (Prof. Donaldson) would be glad if that gentleman would be good enough to give a copy of that work to the Institute, if one now existed in his possession; because, in the records of a man's life it was well to see the movements of his mind, to see how he could turn his attention to matters not connected with his profession, and the interest evinced in other objects apart from the professional course, whether of a military or a political nature. He held in his hand a letter to the Chancellor of the Exchequer on the disfranchisement of the borough of Lancaster, by Edward Sharpe, architect. Thus, whereas their deceased friend wrote on military matters, there were to be found architects of the present day who wrote on matters political. It formed part of a man's character which they wished to know. He hoped Mr. Smirke would favour the Institute with a complete list of the works of his brother. It was not at all a matter of pride or pomp. They wanted to know what he did. The work of a man was the fact of a man's life, and they could best judge of a man's life by his works: therefore, in addition to, and by way of completing the valuable memoir with which they had been favoured, he trusted their friend would furnish them with an accurate list of all the works executed by his late brother. He believed no reference had been made in the memoir to King's College; nor had any mention been made of a very important architectural monument in which the great abilities of Sir Robert Smirke were displayed in the completion of one of the most magnificent sides of Somerset House. It was left an imperfect fragment, not complete, and they could not judge of the beauty of Sir Wm. Chambers' design; but Sir Robert Smirke completed that wing and shewed of what beauty it was capable. He therefore trusted that there would be placed at the end of the memoir a complete list of the works of Sir Robert Smirke, similar to what was done in the case of the memoir of Sir John Soane, to be preserved as an historical record of great interest. With respect to the Institute of British Architects itself, Sir Robert Smirke was connected with it from its foundation. He (Prof. Donaldson) went to him in the first instance to ascertain his opinion, and he gave sound advice. He pointed out that it was of the utmost importance that the greatest care should be taken in the selection of those who should be members—that the Institute should be established on the basis, that men who from personal character as well as from professional acquirements should do honour to the profession in the face of the public; and when he laid before him what had already been done, as well as what they expected to do, Sir Robert said, "There is my contribution as a Fellow." That was honourable in a man at the head of his profession. Here was the starting of a vague idea, questioned by some minds; but he saw at once how important such an Institute would be to the profession, and he immediately gave his decision in favour of it, which was an honourable trait. Their friend Mr. Smirke thought he had given too high and too favourable a view of his brother's character, but it was impossible to do that, both in his professional and personal aspect. Mr. Smirke had alluded to the general introduction by his late brother of the use of concrete as a valuable material for the solid construction of foundations, &c.; but there was another department, which he believed he was correct in stating had its origin in Sir Robert Smirke. That was in respect of the mode in which estimates should be given for public buildings. It was he who initiated the present system of taking out quantities, by employing surveyors on either side, in order that proper estimates might be given. Hitherto, it was left to the builder only to take out his own quantities; but having surveyors on the part both of the architect and the builder, and they agreeing as to quantities, the matter resolved itself into the mere putting the amounts to those quantities. He believed he was correct in saying it was Sir Robert Smirke who introduced that system. The truth was this—the mind of Sir Robert Smirke was concentrated on the one great purpose of his professional life: they saw that in all departments—whether in matters of taste or skill, or economical arrangements, his mind embraced all those purposes, and made him the competent and accomplished architect he had shown himself to be. He would venture to give an opinion with regard to two of Sir Robert Smirke's great works, viz.—the Post Office and the British Museum. He had seen all the great works that were in progress in Paris, and those which had been completed within the last thirty years; but having passed on the previous day before the British Museum, he might be permitted to say this—he did not recollect ever having seen any building which impressed him with such grand ideas of a public building as the British Museum. There was a grand idea of magnificence: there was ample space: the building was conceived on a noble scale of idea: and if it had been permitted to him to carry out the sculptural decorations which his mind embraced and his taste designed to grace those four pediments in front, it would be one of the finest compositions of modern times. He trusted the meeting would excuse this mention on his part of one for whom he entertained the greatest esteem all through his life and professional practice.

Professor R. KERR, Fellow, said he had great pleasure in accepting the honour of seconding the vote of thanks proposed by Mr. Donaldson. He thought few subjects could more profitably engage the attention of the Institute occasionally than biographies of distinguished men—at all events, those who had but recently passed away: and he had always considered, from what little he had known of the career of Sir Robert Smirke—and he thought so more strongly now that he had heard more of that career this evening—that his character was deserving of the careful attention of the younger members of the profession, and perhaps also of those a little older, with respect to those distinguishing features which marked his success. They had been, every one, much interested to-night in hearing the description of the gradual development of character, professional and personal, and career as a leader in their art and in practical building, as shown, first by the memoir written by his brother, and secondly by the remarks of their friend Professor Donaldson. And it was the more interesting for them to observe closely the indications and landmarks of that career when they considered that Sir Robert Smirke belonged, as it were, to a class of architects who had passed away, but only during the last generation—that was, to the generation of architects immediately preceding the present. Fashions would change, and the time would come when the memoirs of the Sir Robert Smirkes of the present day—very different from the Smirkes of the last generation—would be recorded as exponents of principles gone by. They observed in the history of their deceased friend, first—he would not say enthusiasm, for that was scarcely a mark of his character—but the earnest, business-like assiduity with which, from the first, he pursued his avocations. Starting in life at an early age, he appeared to have taken the most ready means, the nearest road, to the attainment of a thorough education in his profession. At a time when the continent of Europe was difficult of access, when persons had to break through the armed hedge which at that time surrounded it, they found Sir Robert Smirke pursuing his studies over Europe, reaching to Italy and Greece. They found him sending home accounts of his progress, not couched in the enthusiastic language to which they were too much accustomed now-a-days—for he (Prof. Kerr) fancied, if such had been the case, his brother would have been inclined to recite it—but animated by a sincere practical and business-like desire to acquire solid and practical useful information, such as should make him in his day and generation an useful and faithful servant of the public. And this was the character they so much wanted to study: this was the character which was so much overlooked. They were apt to forget that they were servants of the public, and not mere enthusiasts amusing themselves individually. On his return from his travels, they found Sir Robert engaged at once in active practice, and entrusted with important commissions almost immediately on his arrival at home. Such a fact indicated the possession of "an old head upon young shoulders;" and when they remembered that Sir Robert Smirke or his friends claimed for him the first introduction of concrete as a building material; and also introduced, to some extent, the use of iron into buildings; and when further they saw that he appeared to have originated that sound and useful custom of employing surveyors to prepare proper bills of quantities for contracts, there they saw the character of a man eminently suited for the work and earnestly set upon it, doing his duty to his generation as a practical man of business. Then, again, when they considered the remarkable absence of disputes with his employers—a trait in which he was afraid many of them could not pretend to vie with Sir Robert—and when they remembered how successfully he appeared to have worked for that most touchy of all clients, the Government, and how successfully he seemed to have operated in pleasing men whom it was proverbially impossible to please, they saw reason to reflect upon the character of such a man; and they must regard him not merely as an honour to the country and the profession, but as a pattern to themselves individually. He had great pleasure in seconding the vote of thanks to Mr. Edward Smirke.

Mr. SYDNEY SMIRKE, Fellow, remarked that his brother had said what he wished far better than he could have done. At the same time, he thought he had scarcely done full justice to his late brother's constructive ability in not alluding to his introduction of the use of iron in domestic buildings. No doubt engineers had used it in their constructions from very remote periods of time; but he thought no architect employed cast-iron largely as a building material until his late brother introduced it. Huge cast-iron bearers were used by him in Lord Bathurst's house, where he had some practical difficulties to overcome, and heavy walls to retain and undermine without injury to the fabric: and cast-iron beams were employed of as large scantling as they were now using. He did not recollect the date of that work. On the subject of concrete, the introduction of that material into buildings might fearlessly be claimed for his late brother, as he was the first to apply it systematically for architectural purposes. The French engineers used concrete, before it was used in this country, as a substitute for the large baulks of timber which in his early days was the usual mode of giving stability to walls in soft foundations; but his brother was the first to introduce it into this country. These, he considered, were two of the most important ingredients in constructive architecture. On the subject of surveyors' quantities he could not speak with perfect certainty: he could only say, as far as his memory would carry him, measurers were employed by his brother much in the way they were now, and he had always attributed to his late brother the introduction of that system.

Mr. THOMAS MORRIS, Associate, said there was one trait in Sir Robert Smirke which he thought worthy of mention, as it bore in a remarkable manner upon the self-denying, conscientious character of that gentleman. It had been regarded almost as a matter of wonder how, with so many commissions on hand at the time of his great success, he was able to give such complete satisfaction to his numerous employers; but he believed the secret of that lay principally in the fact that at the time of that great pressure upon him, he invariably declined any small commissions that were offered to him—say, under £10,000.—in order that he might the more completely devote himself to those larger works which he had in hand, and the more conscientiously discharge his duties in respect to them: and to those Sir Robert devoted the whole of his time and attention. He mentioned this because it was one of those circumstances which could emanate only from a man of the character of Sir Robert Smirke.

The Chairman, Mr. DAVID BRANDON, said, after the very able remarks which had been made upon the paper so carefully prepared by Mr. Smirke, it was unnecessary for him to add any remarks to ensure the author the cordial vote of thanks which had been proposed and seconded; but he could not refrain from expressing his high sense of the excellent taste in which the memoir was written.

The meeting then adjourned.

[N.B.—The Vice-President in the Chair during the Discussion on Mr. E. Nash's Paper "*Remarks on Failures in Construction*," which took place on the 3rd June, 1867, was Mr. JOSEPH CLARKE, and not Mr. CHARLES BARRY, as stated by error in our last issue.]

REVISED LIST OF BUILDINGS

DESIGNED BY THE LATE SIR ROBERT SMIRKE, R.A. &c. &c.

1805—1847.

To be appended to the Memoir of the late Sir **Robert Smirke**, R.A., &c., by **Edward Smirke**, Esq., M.A., Vice Warden of the Stannaries, &c., read at the Royal Institute of British Architects, June 17, 1867.

A considerable portion of the Royal Mint, Tower Hill, London.
Covent Garden Theatre (since burnt down), London.
The General Post Office, London.
The General Penitentiary, Millbank, London.
The British Museum (all the Works up to 1847).
The College of Physicians, Trafalgar Square, London.
King's College, London, (the East Wing of Somerset House).
The Legacy Duty Office, Somerset House, London.
The Centre Portion, internal alterations, and the underpinning of the whole of the Custom House, London.
Various Works of Restoration at the Bodleian Library, Oxford.
Ditto of the Choir of York Minster, after the incendiary fire, 1828.
The Assembly Rooms, Whitehaven, Cumberland.
S. Mary's Church, Bryanston Square, London.
S. Anne's Church, Wandsworth, Surrey.
S. John's Church, Chatham, Kent.
S. Nicholas Church, Strood, Kent.
S. George's Church, Tildesley, Lancashire.
S. George's Church, Brandon Hill, Bristol.
Church at Salford, Manchester.
Church at Netherton, Worcestershire.
Church and Mausoleum at West Markham, near Clumber Park, Nottinghamshire.
Church in Kingsland Road, West Hackney, Middlesex.
Belgrave Chapel, London.
Church at Askham, Lowther Park, Cumberland.
The Interior Fittings of the Chapel Royal, S. James's, London.
The Restoration of the Exterior of the South side of the Temple Church, London.
The Ophthalmic Hospital, Moorfields, London.
The Wellington Testimonial in Phœnix Park, Dublin (not completed).
Courts of Justice at Carlisle.
Courts of Justice at Hereford.
Courts of Justice at Gloucester.
Courts of Justice at Perth.
Courts of Justice and the completion of the County Gaol at Maidstone.
Courts of Justice at Shrewsbury.
Council House, &c. at Bristol.
The County Gaol at Hereford.
Bridge at Gloucester.
Bridge at Carlisle.
Alms Houses at Ledbury, Herefordshire.
The Bazaar, Cheltenham, Gloucestershire.
Lowther Castle, Cumberland, for the Earl of Lonsdale.
Eastnor Castle, Ledbury, Herefordshire, for the Earl Somers.
Kenmount Castle, Annan, for the Marquis of Queensberry.
Erskine House, near Glasgow, for Lord Blantyre.
Strathallan Castle, Perthshire, for James Drummond, Esq.
Luton Park, Bedfordshire, for the Marquis of Bute (since burnt down)
Enlargement of the Priory, Stanmore, for the Marquis of Abercorn.
Newton Don, Scotland, for Sir Alexander Don, Bart.
Various Works at Cardiff Castle Glamorganshire, for the Marquis of Bute.

Villa at Putney Hill, near London, for Lady Guildford.
Rose Hill, Robertsbridge, Sussex, for J. Fuller, Esq.
Various Works at Sedbury Park, Chepstow, Gloucestershire, for G. Ormerod, Esq.
Whittingham House, N.B., for—Balfour, Esq.
Hardwicke Court, Gloucestershire, for J. Baker, Esq.
Various Works at Stourton Castle, Stourbridge.
Various Works at Nuneham Park, Oxfordshire, for Vernon Harcourt, Esq.
Various Works at Bowood, Wiltshire, for the Marquis of Lansdowne.
Drayton Manor, Tamworth, Staffordshire, for Sir Robert Peel, Bart.
Various Works at Clumber Park, Nottinghamshire, for the Duke of Newcastle.
Various Works at Belton Park, Lincolnshire, for Earl Brownlow.
Various Works at Cirencester, Gloucestershire, for Earl Bathurst.
Portion of Stafford House, St. James's, London, for the Duke of Sutherland.
Mansion in Whitehall Gardens, London, for Sir Robert Peel, Bart.
Mansion in Halkin Street, London, for the Earl of Oxford.
Mansion in Portman Square, London, for Earl Manvers.
Mansion in Belgrave Square, London, for Earl Brownlow.
Part of the Mansion of the Marquis of Hertford, in Piccadilly, London.
The Gallery in Lansdowne House, Berkeley Square, London, for the Marquis of Lansdowne.
Addition to the Mansion, in Berkeley Square, London, of the Earl of Powys.
Mansions for J. W. Croker and for H. Baring, Esquires, Carlton Gardens, London.
Walberton House, Sussex, for R. Prime, Esq.
Haffield House, near Ledbury, for W. Gordon, Esq.
Normanby Park, Lincolnshire, for Sir R. Sheffield, Bart.
Shillingthorpe, Leicestershire, for Dr. Willis.
Various Works at Powys Castle, Welchpool, for the Earl of Powys.
Edmond Castle, Cumberland, for T. H. Graham, Esq.
Eden Hall, Cumberland, for Sir P. Musgrave, Bart.
Kinfauns Castle, Perthshire, for Lord Gray.
Oulton House, near Leeds, for J. Blaydes, Esq.
Armley House, Yorkshire, for Benjamin Gott, Esq.
Alterations and additions at the Grange, Hants, for A. Baring, Esq.
The Union Club House, Trafalgar Square, London.
The Carlton Club House, London. (since rebuilt).
The Junior United Service Club House, Regent Street, London (since rebuilt).
The Oxford and Cambridge Club, Pall Mall, London, jointly with Sydney Smirke, R.A.
The Library and adjacent Chambers, in the Inner Temple, London.
The Interior of the Dining Hall, Ditto.
Harcourt Buildings, Ditto.
King's Bench Walk (South End), Ditto.
Paper Buildings (North End), Ditto.
The South Side of Tanfield Court, Ditto.
Mitre Court Buildings, Ditto.
Serjeant's Inn and Judges' Chambers, Chancery Lane, London.
Banking House, Lombard Street, London, for Messrs. Whitmore (since pulled down).
Strand Buildings, adjoining Exeter Hall, London.
The North and the South Approaches to London Bridge, from the Mansion House and from the Borough.
Moorgate Street, London.
The Façades of St. Thomas' Hospital, London (now in part pulled down).
The Rectory Houses of St. Magnus and of St. Mary Woolnoth, London Bridge.
The Offices of the Duchy of Lancaster, and Lancaster Place, Waterloo Bridge, London.
The Offices of the Equitable Assurance Company, Blackfriars, London.
The Temporary Houses of Parliament, London, after the Fire.

A few minor Works and all Designs not carried out, are omitted in the above List.

OCCASIONAL PAPER.

LETTERS and REMARKS in reference to the late WALTER HODGKINSON, Associate,

At the Ordinary General Meeting of the Royal Institute of British Architects, November 5th, 1866,

The President, A. J. B. BERESFORD HOPE, M.P., &c., in the Chair.

The PRESIDENT said there was another gift to the Institute, viz.—a series of original sketches and measured drawings (some of which now covered one of the walls) which, under the peculiar circumstances, would not be included in the ordinary recapitulation of donations. It was the legacy to the Institute of one early called away from the profession and art which he illustrated—Mr. WALTER HODGKINSON, an Associate,—whose decease had been announced in the previous Session. The drawings before them were selected from a very large collection, and he was sure they would all agree with him when he said no member of the Institute could confer better service on that body than contributing the works of his own pencil, so as to store up for use a large collection of architectural drawings of buildings and ruins like those which then adorned the wall. This bequest of Mr. Hodgkinson, together with a former one by the late Mr. Lockyer, he hoped would form a foundation on which a goodly structure of well executed drawings would in future be raised.

The following is a Letter from Mr. WM. SMITH, which was read at the Meeting in connection with the Presentation.

Drummond Chambers, 10, *John Street*, *Adelphi*,
November 1*st*, 1866.

Dear Sir,

I forward you a Portfolio of Sketches and Drawings made by my friend, the late Walter Hodgkinson, A.R.I.B.A., and bequeathed by him to the "Royal Institute of British Architects."

Mr. Hodgkinson was a pupil of the late Mr. R. C. Carpenter, and after Mr. Carpenter's death he completed his articles with Mr. Slater, and remained in the office until Christmas last.

Under these circumstances I cannot enumerate many works of Mr. Hodgkinson, but I feel sure that Mr. Slater will gladly acknowledge the very valuable assistance he received from him upon some of his important works. Amongst others, in the restoration of the Choir of Sherborne Abbey Church,—Chichester Cathedral Fittings, &c.; and last, though not least, in the admirable restoration of the Parish Church at Tring.

In the matter of the Reredos at Tring Church, Mr. Hodgkinson's name was associated with Mr. Slater's, and the New School and Master's House there were entirely his work.

At Christmas last Mr. Hodgkinson commenced to practise for himself, but occupied his office only a few days, his death occurring on the 7th day of June last, at the early age of thirty years.

I am sure that I speak for all who knew him, when I express a deep feeling of regret that a life of so much promise should have been so prematurely cut off.

With reference to the sketches and drawings they are entirely the work of his own hands; the sketches and measurements taken during the short annual holiday which he was able to obtain. As I had the pleasure of accompanying him on more than one of his tours, I can testify to the very careful and accurate manner in which all the details given were measured by him. In these matters, and in fact in all he undertook, his great endeavour was to work accurately and most thoroughly.

Of his private character as a Christian and a gentleman I am sure no one can speak too highly.

If you will be so good as to bring this matter before the members of the Institute, you will greatly oblige,

Yours very faithfully,
WILLIAM SMITH.

C. F. Hayward, Esq.

Also the following from the Rev. H. A. Harvey, Incumbent of Tring, to Mr. William Smith:—

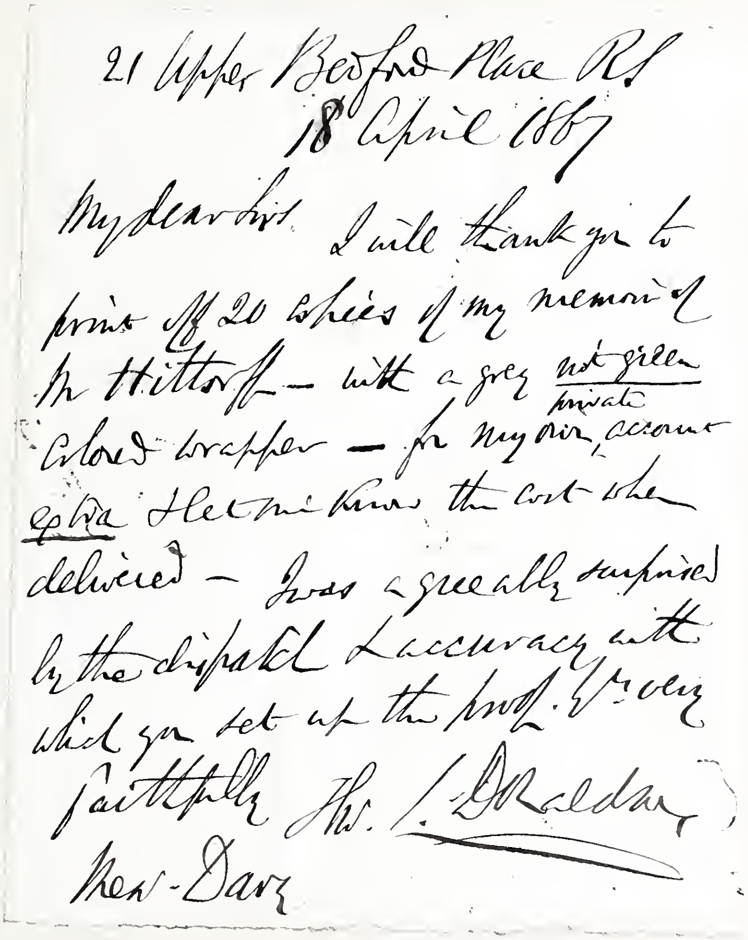
I hear with satisfaction from you this morning, that at the approaching meeting of the Royal Institute of British Architects, Walter Hodgkinson's name will not be forgotten. You know how much I have thought of his loss, both to myself personally and to his family and to his profession. It is his loss in the last respect that will be felt most generally at the meeting of his late brother architects; amongst whom, I am sure, so far as he was known, his talents were highly appreciated, and doubtless the drawings which you tell me are to be exhibited at the meeting, and the remarks which friends will make upon his memory, will shew to a still greater number of the profession how valuable a member they have lost from their body. Our valued architect, Mr. Slater, whose restoration of our church here at Tring has been so much admired, will be best able to certify to the assistance he had in Hodgkinson. For myself I must add that I consider the greatness of his loss as an architect more than doubled by the excellence of his private character. He was one of the best of sons and most generous of brothers, and I really believe that in his professional labours the glory of God, the good of the church, and the true beauty of holiness were the motives that animated him. As his example has been taken from us, may it be remembered! I send you a copy or two of my sermon on the occasion of his death for any to whom you may deem it likely to be acceptable.

Mr. Gordon Hills, Fellow, added the following information to Mr. C. F. Hayward, Hon. Sec.

I was anxious to have been present on the occasion of the presentation to the Institute of the drawings bequeathed by my late friend, Mr. Walter Hodgkinson. I find unfortunately that my attendance will be prevented, and I would therefore beg you kindly to permit this letter to speak for me, and to pay a tribute to his memory.

I knew Mr. Hodgkinson from his first entrance into the office of the late Mr. R. C. Carpenter as a pupil, I think in 1853, and being then myself one of the assistants in that office, and down to Mr. Carpenter's death in 1855, I had many opportunities then and in a continued intercourse ever since for appreciating his character and talents. In bearing and feeling he was eminently the gentleman and Christian; perfectly modest and unassuming he was most intelligent and industrious, and soon exhibited much taste in artistic matters and an ability in drawing which ripened into great skill in delineation, and judgment in design. In common with all who have known him I sincerely lament the early termination of a career where such thorough uprightness and integrity, and so much skill, thoughtfulness, and resolution of purpose, had raised a high promise of usefulness and success.

Mr. William Slater, Fellow, was desirous to add a few words in bearing his testimony to the public and private worth of his friend, Mr. Walter Hodgkinson, who was a pupil of the late Mr. Carpenter, and he completed his articles with himself. During the whole of that period he shewed great ability, and up to within a short time of his decease he was a most valuable assistant in the office. Had his friend's life been spared, he would have been a great ornament to the profession.



21 Upper Bedford Place R.S.
18 April 1867

My dear Sirs. I will thank you to print off 20 copies of my memoir of Mr Hittorff — with a grey *not green* colored wrapper — for my own private account *extra* & let me know the cost when delivered — I was agreeably surprised by the dispatch & accuracy with which you set up the proof. Yrs very faithfully Thos. L. Donaldson

Mess. Davy

OCCASIONAL PAPER,

Read at the Ordinary General Meeting of the Royal Institute of British Architects, April 8th, 1867,

By Thomas L. Donaldson, Past President.

JACQUES IGNACE HITTORFF

WAS born at Cologne, August 20th, 1792, and was early taught, after the old German manner, to prepare himself for his future career by handling the mason's tools. In 1810 he went to Paris and pursued his studies under the architect Belanger, a very able master and kind friend, who constructed the glass dome of the Halle au Blé, to cover the vacant area of the Central Court as originally left. He continued to attend the schools of the Ecole des Beaux Arts, where Percier recognised the abilities of the young architect, and ever after proved his constant friend. Upon the return of the Bourbons to France in 1814 Monsieur Belanger was confirmed in his appointment of architect of the public fêtes and ceremonies, which he had previously filled, and he appointed his young friend Hittorff as his assistant inspector, having for his colleague M. Lecointe. This public appointment influenced materially the future professional life of our friend, for ever after we find him constantly employed by the public authorities in connection with the public ceremonials, in the municipal buildings and embellishment of the open spaces of the French metropolis, and in the erection of the places of amusement and recreation.

With his colleague, M. Lecointe, he designed and superintended the funeral pomps and burial of the Prince de Condé, of the Duc de Berri, and of Louis XVIII., as also on festive occasions the marriage of the Duc de Berri, the baptism of the Duc de Bordeaux, and at Reims the coronation of Charles X. They also reconstructed the interior of the Salle Favart, and in eight months rebuilt the graceful and commodious theatre of the Ambigu Comique. In 1820 to 1823 he visited England, a part of the North of Germany, the South of France, Italy and Sicily. In his journey to the latter country he was accompanied by his pupil, Herr Zanth, and his friend, Herr Stier, and returned enriched with a fine collection of sketches and drawings of the several monumental buildings of those parts. The lamented Zanth, you will recollect, gentlemen, as one of our honorary and corresponding members, when architect to the King of Wurtemberg, and who, on his death, bequeathed to us one of his beautiful drawings of Monreale in Sicily : and Herr Stier became the eminent professor at Berlin.

In 1826 M. Hittorff published with M. Zanth, the results of this journey in the "Architecture Moderne de la Sicile, fol. Paris, 1835," and in the "Architecture Antique de la Sicile, fol. Paris, 1837." I must first call special attention to the work on Modern Sicily, which, for variety of subjects, exquisite drawing and tasteful illustration, offers a rich collection of novel ideas for the architect in the churches, hospitals, convents, palaces, Saracenic remains, and for the number and decorations of the public fountains (in which Sicily is unrivalled). The work on the Ancient Architecture of Sicily is the first volume of an intended series, illustrating only a portion of the ancient monuments of that country, and is executed with the conscientious precision and with the enlarged intelligence, which previous works on Greek Antiquities afforded to minds so enquiring as those of the authors. The restorations of the temples of Segeste, and of Selinus were drawn out to a large scale and with the usual artistic distinctness of the French school, and the exhibition of them before the Institute of France at once procured the approval of its distinguished members. It would ill become me to draw a parallel between the publications of previous or subsequent writers, such as Saint Non, in the "Voyage Pittoresque," the volume of our own Wilkins, or the more recent tomes of the Duca di Serradifalco; but the experienced professional intelligence, the more profound acquaintance with antique monuments, and the artistic feeling of M. Hittorff and his companions, invest their publications with more than ordinary importance. I am happy to inform you that the concluding volume on the "Sicilian Antiquities" was just completed by M. Hittorff for publication. All the plates are ready, and I learn from his son that he was, at the decease of his father, engaged upon the revision of the last part of the text, so that we may soon expect its appearance. It will be a most interesting section, as it contains the total restoration of a Greek Doric temple in all the integrity of its minutest parts, and many of the vexed questions will be solved according to his views, with the reasons elaborately explained.

You, who are so well acquainted with M. Hittorff's predilections of classic taste and his immediate subjects of study, will readily understand how these special researches in regard to such remains, as those of Pompeii and Sicily, which contain profuse evidences of color as an essential feature of the decoration of the edifices of antiquity, made a deep impression upon the mind of our late colleague, excited by the essays and pamphlets which had appeared already in Germany, France, and England, upon the subject of polychromy, as practised by the ancients in their works of art. All these influences concentrated with immense effect upon his artistically impressionable susceptibility, and whether in the ruins of edifices, in the fragments preserved in museums, in the vases, tiles, pottery, Etruscan tombs, or other sources of evidence, he sought to discover the principle which guided the Greeks or Romans in the application of colour. Seconded by the erudition of his learned friend Letronne, he enlisted the evidences of all the ancient authors, who had even by mere indirect expressions alluded to a subject, which, recognised as it doubtless was by all antiquity, required no more direct allusion as witness to the universality of its practice. This noble work on the polychromatic architecture of the Greeks, or restoration of the Temple of Empedocles at Sulinus, concentrates all the evidence procurable on the subject, and sums up the results to be derived from them. The careful elaboration of the design and the exquisite execution of the coloured plates, with the learning of the essay, which minutely justified each step in the elaborate investigation, places this work as the climax of proof and reasoning on the subject, and exhibited the extent of his antiquarian knowledge, and the practicability of its application to some of his own buildings.

In 1832 M. Hittorff published with M. Olivier, the celebrated architectural engraver, a French edition of the English work on the "Inedited Antiquities of Attica," in order to complete the series of translations of the English works, which up to that period had appeared on Greek antiquities, as "Stuart's Athens," and the previous volumes of the Dilettanti Society upon the monuments in Asia Minor. He dedicated this work to his old master and friend, M. Percier, in a few touching words of grateful affection. The plates, which in the original are shaded, are in this edition in outline, several restorations were added, and notably one very useful plate containing a parallel of all the monuments drawn to the same scale, affording the opportunity of a comparison of their relative sizes and designs, and many judicious notes were given in further explanation of the text.

Hitherto I have briefly dwelt upon some of the studies of the scholar and the productions of a brilliant author, rather than upon his other more immediately practical labours as an architect: and it might be imagined that such publications would fully engage the whole time of a professional man. On the contrary, they were (I might almost say) the relaxations of an elegant mind amidst other. absorbing matter-of-fact occupations. I think his earliest work in the Champs Elysées must have been the circular Panorama, built in 1838, equal in diameter to the Pantheon at Rome, and the roof of which he supported in a most original manner on the suspensive principle, by a most ingenious arrangement of twelve iron cables, and which admitted the uninterrupted passage of the light upon the picture of the circumference. It was described in July, 1842, at one of our ordinary meetings From that time to this the Champs Elysées have been the arena, on which he has exercised most happily his fertile imagination in the erection of fountains, restaurants, cafés chantants, and other constructions for the amusement of the people, the most important however of which is the Grand Cirque Olympique, now called of the Empress, built in 1839. This is well known to all who have visited Paris as a sixteen sided building, capable of holding 4000 spectators, for equestrian exercises, above 134 feet in diameter, and covered by a roof without a tie beam, the stability of which depends upon the circular or polygonal curb against which the feet of the rafters rest; attached is stabling for the horses of the troup. The decorations are conceived in the best taste, so that the vastness of the area without any central pillars and the elegance of the ornamentation place it in the same rank with the large and more costly productions of the like nature of the times of the ancients. M. Hittorff mentioned to me an incident, most gratifying to himself, that occurred in the erection of this responsible work. His employer left him *carte blanche* with the obligation of completion within a certain period. The construction was so difficult on account of the nature of the soil, and the whole matter so novel in every respect, that M. Hittorff spent several hours every day upon the spot, and he observed in like manner that his employer was always there, critically observing all the operations. At length M. Hittorff asked him the reason of his close *surveillance*, to which the reply was, "I have felt naturally anxious, both as to the progress of the work and the outlay, and I was determined myself to be witness of what was going on. M. Hittorff I have seen the unwearied attention you have bestowed on your work, which I feel will be as advantageous to me as it will be honourable to you. I have proved that there is no need of my presence to urge on all concerned, or to induce a careful economy, and you will not see me here any more till the conclusion." The success of the whole was, in fact, so complete, that the Circus was opened at the period named, and a very few years sufficed to pay off the necessarily considerable cost of the erection. In 1851 a larger and a more sumptuous Circus was erected on the Boulevard des Filles du Calvaire in nine months, with increased reputation to the author, and enriched, as was also the other Circus, with the sculptures of the eminent Pradier and Duret, and the pictures of M. Berrias. M. Hittorff assisted in the erection of the obelisk of Luxor in the Place de la Concorde, and designed the pedestal. His enquiring mind was not satisfied with the rude condition of the rough and as it were fractured apex, and it occurred to him, that it could not have been left so exposed by the ancient Egyptians, all of whose works are finished off with such precision, regardless of labour or expence. At length it occurred to him that there must have been some artificial finish to the summit of the monolith, and further research proved to him that it must have had a bronze gilt capping, or pyramidion, a conclusion which he fully justified in a pamphlet that he published at the time; but his suggestion was not carried out, and the apex still remains in its fragmental state.

To M. Hittorff's graceful taste is due the design for the colossal fountains in the Place de la Concord, combining sculptural and architectural forms in an admirable manner, and the jets casting forth volumes of water, more abundant than those even of S Peter's at Rome, and in magnificent contrast with our squirts in Trafalgar Square. He also materially modified in other respects the original conception by Louis of what may be considered the most magnificent Place of all Europe, surrounded as it is by the gardens of the Tuilleries and of the Champs Elysées, the Garde Meuble, the portico of the Old Chamber of Deputies, with the avenues commanding views of the Madeleine, the Arc de Triomphe de l'Etoile, and the Tuilleries Palace.

Mons. Hittorff was associated in the erection of the basilica Church of S. Vincent de Paul, near the station of the Chemin de fer du Nord, with the estimable and accomplished Mons. Le

Père,[*] father of Madame Hittorff, with whom, through all the varied joys and trials of professional life, he passed a happy wedded union of above 40 years, in tastes and feelings most congenial, and which rendered the domestic hearth the happiest of homes. I know not to what extent the conception of this great Church was due, respectively to the genius of one or the other of its architects, but the death of Mons. Le Père occurring in the course of the work, the completion was necessarily directed wholly by his son-in-law. The Basilica of the Romans was a favorite theme of M. Hittorff, as we know by his published restoration of the Basilica of Fano from the text of Vitruvius. On the present occasion he sought to realise some of his early impressions, reconciling them with the special purposes of a Roman Catholic place of worship. The nave and side aisles, divided by a line of columns two storeys high, with a gallery and flat roof, and hemicyle at the altar end, have a very grand effect, and christianise, as it were, the heathen elements of such a disposition. The whole of the details and embellishments symbolically treated, and the colouring and gilding are of the most refined Greek taste, and notably are to be admired the magnificent series of stained glass windows, and the decorations of the podium between the upper and lower ranges of columns, consisting of a procession of the Saints, male and female, of the Roman Catholic Church, painted by the inimitable and lamented Flandrin, the first of Ecclesiastical painters of the present period. The church lies on the sloping side of a hill, which required a magnificent flight of steps to reach the Portico, and this is realised by a series of divisions of easy ascent and varied plan, flanked by ballustrades, forming a grandiose basis to the church itself. Mons. Hittorff had contemplated the decoration of the walls of the Portico with paintings, as shewn in one of the plates of his work on Polychromy, illustrating subjects from the Old and New Testaments, to be executed on enamelled slate or stone, in the general adoption of which enduring process he took great interest, as being peculiarly adapted for mural decoration of public buildings. These paintings were partly executed, but did not seem to meet public favour, and have since been removed.

The notice of this church leads me to observe one of the peculiarities of Paris in regard to its religious edifices. The whole City is divided into arrondissemens, with a like ecclesiastical distribution. In each municipal division there is (or intended to be), a central Basilica of gigantic proportions and cathedral like arrangement, each one at a cost of one or two hundred thousand pounds, or even more, subordinate however to the Metropolitan Cathedral. Of this class on the north side of Paris, are the Madeleine, Notre Dame de Lorette, S. Vincent de Paul, and the churches in the Boulevard Malesherbes, and in the quarter of the Chaussée d'Antin, now nearly completed, and forming so many ecclesiastical centres grouped around the Mother Church of Notre Dame.

The municipality provides a like class of edifice for the local civil administration of each arrondissement, consisting of a Mairie, carried out in the like sumptuous way; for happily our neighbours are not satisfied with the erection of their buildings, intended for public purposes, in an humble and niggardly economical manner, as our police offices, but require that they should add to the dignity of the Metropolis. These Mairies combine various functions for daily and occasional use, and they thus afford the opportunity of considerable architectural effect. M. Hittorff executed one on the Place du Pantheon, the staircase of which is a very striking feature, and he completed the suite of buildings opposite the Eastern façade of the Louvre, and close to the Church of S. Germain l'Auxerrois, by a Communal School distinguished for its arrangements, a Presbytery and a Mairie for the quarter in the Renaissance style, repeating some of the leading features of the adjoining church. This, however, cannot be cited as one of his successful compositions. He enlarged and completed near the Barrière du Trône for Her Majesty the Empress, an Institution for the reception and education of 300 daughters of workmen, and he carried out a distribution of part of the Bois de Boulogne in conformity with an original sketch by the Emperor, which he once shewed me as one of the curious treasures of his study. He designed the circular range of circular edifices surrounding the place of the Arc de l'Etoile, and from which radiate various Boulevards to different parts of Paris and the suburbs.

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[*] M. Le Père, born at Paris, 1761, deceased 1844, was member of the Scientific Expedition to Egypt, and prepared many important drawings for the large work on that country. He was joint architect with Gondouin for the bronze column of the Place Vendome, and subsequently contrived a most ingenious scaffolding, fixed on the capital, for raising and placing the statue on the monument.

Time would fail me to recite all the works which our late Colleague either designed or executed during his long and active life of professional experience. In Paris alone, whether to the north or south, the east or west, or very centre, we find monuments of his skill and taste profusely scattered. I have not dwelt upon their distinctive merits, nor have I paused to analyse their disposition or arrangement, the styles he adopted for each, or the more or less success of each effort. I address myself to his professional brethren, who are fully capable of forming their own judgment, and who require no critic to lead them to a conclusion. It is enough, in such a rapid notice as this, to indicate the most notable that the history of our art cannot fail to record, and which are the best tests of his various powers, and which procured his reception in the Imperial Institute of France in 1853, the award of our Royal Gold Medal in 1856, the election in numerous Foreign academies, and crosses and honorary distinctions from various Continental Sovereigns.

The last great work of our friend, and which is in effect a colossal one, is the terminus at Paris of the Great Northern Railway of France. This propylon as it were, of the Egyptian and Greek type,* consists of three circular headed archways of the Ionic order and tetrastyle treatment, each crowned with a pediment and graduating in size, and with intervening Doric colonnades, the whole consisting of purely Greek detail, and enriched with Sculptures of the highest class. I must own that, impressed as I was when I first saw it, I felt staggered by the audacity, with which all the usual canons of art were disregarded in the general composition, and yet producing on the mind a most imposing and, it may be said, solemn effect. I have stood at periods before it to study the elements of the design, and how the like impression could be produced by any other more severe treatment, but in vain; and I could not but render homage to the genius of the architect, who, by a most capricious mastery of his subject, could successfully render himself independent of the ordinary conventionalisms of his art. This is a most striking instance of the different treatment, with which such stations are handled in France and England: with them, it is to be a monumental object, to impress the stranger with the imperial greatness of the capital of France, and to develope its taste for all the resources of architecture and the sister arts; with us it too often results in a huge magazine or shed, or an enormous refuge of a colossal hotel to receive the wearied traveller.

I have also mentioned his larger publications as an author, but his pen and fertile imagination were unceasingly at work, embodying in memoirs from time to time the practical results of his own observations upon the passing topics, constantly arising in such an artistic circle as that of the French Metropolis, and among numerous biographies one of our distinguished colleague, the late Sir Charles Barry, in 1860.† Another of his most recent essays read before the French Institute, drew attention to the analogy existing between the fresco decorations of the Roman Baths and of Pompeii and the rock cut façades in the valley of Petra, shewing a complete identity of the two, and that the wall paintings of the Romans were not merely capricious exercises of the painter's fancy, but actual and therefore valuable records of existing buildings. The decease of our late friend is the more to be deplored, as in him we lose the sole surviving earnest disciple and most able exponent of pure classic art.

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* The total length of the front is 518 feet, and the total height, to the top of the statue of the City of Paris, is 115 feet. The lofty columns of the interior and other cast-ironwork were executed at Glasgow.

† He wrote many articles in the Encyclopedie des Gens du Monde, treating on architecture and history, and on the Sphyrelaton or moulding in repoussé work in metal, as practised among the ancients and moderns, and as applicable to colossal statuary: on Artistic Journeys in the Puglia, Basilicata, Caucasus, Persia, Greece, &c. The Catalogue of this Institute contains the titles of most of his works.

We have thus briefly considered our late colleague as an architect and artist, as also as an author; and we have seen how accomplished, learned, and profound, and ready he was with his pencil and pen. These impressions were confirmed, if you saw him in his elegantly arranged study, there even from early morn, surrounded by exquisite drawings, choice marbles, terra-cottas, casts, library of rare and costly books and other memorials of the finest monuments of all ages and in all countries, from Ancient Egypt to Modern Europe; himself the refined, the rare interpreter of their excellences, and of the hidden mysteries of design and treatment, which render the architecture of the past the types for future generations to study and emulate. Follow him into the inner recesses of his home, itself an atmosphere of art, adorned almost exclusively by portraits of those near and dear to him by his valued and venerable friend, the illustrious Ingres, whose decease preceded his own by only a few months. In this home you saw the tender husband and parent, the warm devoted friend. In public life he was the generous competitor for fame and honours, the encourager of the youthful aspirant in science, art, or letters. In fact, he was a man by whom it was a privilege to be known and esteemed, and a bright example for imitation.

Note.—The official programme of M. Hittorff's titles and distinctions is as follows:—

Membre de l'Académie des Beaux Arts de l'Institut de France, Architecte du Gouvernement, officier de l'ordre Impérial de la Légion d'Honneur, Chevalier de l'Ordre pour le Mérite de Prusse, décoré de la Grande Médaille de la Reine Victoria, Commandeur des ordres de l'Aigle Rouge de Prusse, de St. Grégoire le Grand, d'Albert le Valeureux de Saxe, du Mérite de St. Michel de Bavière, du auveur de Grèce, Chevalier de l'Order de la Couronne de Wurtemberg, Membre Honoraire et Correspondant de l'Institut des Architectes Britaniques, Membre des Académies des Beaux Arts de St. Luc, de Berlin, de Vienne, de Munich, de Belgique, de Copenhague, de Milan, d'Amsterdam, de Rio de Janeiro, de New Yorck.

See also the "Biographie Universelle et Contemporaine," *sub nomine*, and M. Raincelin's "Biographical Account of J. I. H.," and the eulogy by M. Lehmann, Vice-President of the Impérial Institute of France, delivered at the tomb on the occasion of the interment, published in the "Moniteur" at the time.

OCCASIONAL PAPER.

At the Ordinary General Meeting of the Institute of British Arthitects, April 29th, 1867,

The President, A. J. B. Beresford Hope, M.P. &c., in the Chair.

Before proceeding with the ordinary business of the Meeting, the **President** remarked that probably all present had heard of and had lamented the death of that veteran soldier in the noble army of architects, Sir Robert Smirke, one whose fame looked to a generation long before their own. As they were aware, from his very advanced age, Sir Robert Smirke was unable for many years past to take an active part in the work of this Institute, but he showed his sympathy with it by allowing his name to remain upon the list of its Honorary Fellows up to the time of his decease. A Memoir of him, containing a record of his works, more worthily than he (the President) could profess to give, was in course of preparation by his brother, Mr. Edward Smirke, which he hoped would be read during the present Session, but he could not let this first opportunity after his decease pass without calling the notice of the Meeting to it. There was another decease announced in the papers that morning, viz. that of Lord Llanover. His Lordship was not a member of their body, but he (the President) obtained his consent last year to becoming one of their Honorary Fellows, and probably the lingering illness which the noble Lord experienced was the reason why that consent had never been carried out. It was, however, due to the memory of the late noble Lord to state that during the time he held the office of First Commissioner of Works he did a great deal in improving the appearance of the Metropolis, particularly with regard to the Public Parks; and it should also be stated that he was the means of instituting the competition in the designs for the Public Offices. Under these circumstances he considered that the decease of the noble Lord claimed respectful notice on the part of this Institute.

PRESENTATION OF THE ROYAL GOLD MEDAL.

The **President** rose and said—Gentlemen of the Institute, Mons. Texier, and (may I single out the name of my friend, Professor Donaldson, my predecessor in this chair?) by a rare felicity it has devolved upon me for the third time since I have filled this chair to be Her Majesty's representative and your representative in presenting the Royal Gold Medal of this Institute. The first I gave, on account of the absence in Italy of Mr. Donaldson, to our old and honoured friend, Mr. Pennethorne, for his long services and for all the public buildings he has with such industry and ability carried out. Next year it was my happiness to give it to one whose professional career had been shorter than that of Mr. Pennethorne, but whose brilliant talents we all recognised—my personal friend, Mr. Digby Wyatt. This year, by our rules, the third anniversary comes round in which we solicit Her Majesty to allow us to confer it upon one who has followed the same studies as ourselves with honour and distinction in some foreign country. This year, gentleman, it so happens that we give the Gold Medal to its twentieth recipient. On the tenth occasion I find it was presented to our friend Mr. Owen Jones, who I am glad to see here to-night, and I happened on that occasion to be present, as a young member of the Institute, when Lord De Grey acted on our behalf. On this occasion, the twentieth,—that is a long time to look back upon—it has fallen to us to invite one of a foreign country, one whose writings are in a foreign language, but not the less known to us for that, not the less perused by us, and not the less held up by us as an instance of that great brotherhood of science and art all over the world which it is our duty and privilege to promote. For this year's recipient of the Royal Gold Medal we have the long-honoured name of Charles Texier—(loud applause);—and when I mention the name of M. Texier, I look back upon a long record of continuous and arduous labours—labours not carried out in the full glare of civilisation, where the encouragement of fellow-students, the glitter of a court, the incitement of scientific society, or social encouragement cheers the labourer on his course; but where long and painful journeys, scanty accommodation, barbarous inhabitants, the broiling sun and the chills of night, the uncertainty whether some accident might not bring all that he had done to a premature conclusion, are the daily incidents of his career. Against all these difficulties the distinguished and veteran warrior in art and science now before us has fought. When I look back upon the records of M. Texier's artistic career, they carry me back to a period of some forty years ago, when many in this room were not born, when others were of that tender age when tops and toys, rather than buildings and inscriptions, were the favoured objects of their zealous care.

M. Texier (continued the President) has fought this long and arduous battle: he has won it: he has made the western world master of that art progress, of that great history of the old-world nations which have left their monuments perishable in material, but imperishable in fame on the shores of the Ægean Sea. If we look for his labours in Asia Minor and Persia we find them embodied in monumental works; and it is only a very few years ago that, in connection with one of our body, Mr. Pullan, M. Texier illustrated another, but most important chapter in the history of the architecture of the world, the Byzantine Architecture of Thessalonica and other eminent cities, and for that, too, we owe him our great thanks. We are glad, therefore, to award this great mark of distinction and merit to M. Texier; as the Institute of British Architects we are willing and anxious, and desirous to meet him with the right hand of fellowship, and to honour with all honour merit like his. In M. Texier we welcome a foreigner; in M. Texier we welcome—not an architect—but an artist, author, and antiquary. If we were to go on in our own narrow insularity, recognizing no merit beyond it, we should get narrow, cramped, and bigoted; and if, on the other hand, we restrict our ideas of merit to the architect and to the builder, if we look upon constructive architecture as all we have to care for, then we become also, in another sense, narrow, cramped, and bigoted. To those who follow such a course the refinement which art education alone can give will more and more vanish out of sight. That has not been the creed of this Institute. (Hear, hear.) That never will be the creed of this Institute. We desire more and more to repudiate it; and therefore on this, the twentieth anniversary of the presentation of the Royal Gold Medal, we give the medal to one who is neither an Englishman nor an architect, but who is a citizen of a great and illustrious nation, our nearest neighbour, who, as an architectural artist and writer, has done such good service to our great common art and study. I accept the omen. I will not further recapitulate what M. Texier has done. His name is with us a "household word," and it has often been welcomed here. He is an Honorary Member of our body, and we are glad to join him personally more closely to us in presenting to him what we desire should be known and regarded as the "blue ribbon" of English architecture. This day is the last on which I shall leave this room your President. I am proud—I am gratified that the last act of my official life here should be one so worthy of your Institute, and one which, as your mouthpiece and representative, I feel such honour in carrying out.

The President then presented the medal to M. Texier, expressing in French his gratification at having the honour of so doing, and complimenting the medallist.

M. Texier then favoured the Meeting with an address, of which the following is a translation:—

Mr. President and much honoured Colleagues,

I am happy to find myself once more among you and able to thank you for the honour, which you have done me — an honour, believe me, far beyond my deserts. When a man, yielding to an irresistible impulse, has devoted his life to the study of art, and finds himself at the close of his career about to receive the highest reward which he could covet, he has nothing further to desire. He readily forgets the trials and disappointments, which inevitably attend the traveller in this long journey of life, remembering only the satisfaction of seeing his humble efforts appreciated by those, who are most capable of estimating their worth.

But, above all, I am bound to acknowledge that whatever taste for literature—whatever love for the fine arts I may possess, is due to the influence of those illustrious men who have gone before me. It was chiefly from the works of Stuart and Revett, and from those of the Dilettanti Society, that I learned to illustrate with conscientious care the monuments of antiquity, and never to relax my efforts, until I could furnish my readers with a detailed and accurate representation of such structures. Before the time of those, our classic precursors, it must be confessed that antiquarians and artists were satisfied with less careful illustration, and too often substituted for the real the idealities of their own imagination. I do not fail to remember other writers who, without having devoted themselves to any special department of the fine arts, have rendered great service to historical studies; and first, I must cite Pocock, an author as judicious as he was erudite, and whose works are continually consulted by all who are occupied with that noble theme—the history of the Past. Chandler should not be forgotten, for to the Eastern traveller he was an exact and judicious guide. You see, gentlemen, that the country of Inigo Jones and of Sir Christopher Wren need not be jealous of other nations as to the advance which has been made in the field of antiquarian research. I need not say, however, that the task before us is far from complete. Science herself is at once inquisitive and indiscreet:—inquisitive, because the solution of one question only invites the discussion of another; indiscreet, because she desires that all who respect her should partake in the discoveries which she has made. It is not only the annals of history which she would reveal to us. Taking ancient monuments as unimpeachable evidence of the past, she desires to re-ascend the current of time. She would know, not only who those men were whom we call our ancestors, but of what kind were the various nations, which peopled Europe at an age when its extent remained still uncalculated. Do we not find at the present day evidences of human races who dwelt in caverns, I might almost say, in company with the very beasts of the field,—those troglodytes, of whose existence Greek historians remind us, even in the countries of Asia? By the side of such relics of humanity as are found in caverns, we also discover evidences of human industry — arms made of rudely-wrought stones; and even at that early period, art, the inheritance of our species, is manifested in the drawings scored upon the bones of animals with sufficient precision to enable us to recognise the object represented. At a later epoch we know that these people, or, perhaps the generations which succeeded them, left their caverns and descended to the borders of the lakes, founding here and there a village. Fishing, an occupation more elaborate in its appointments than that of the chase, became their favourite occupation. It is from this period that we may date the fish-hook, the dart, and the fragments of pottery, which are still discovered among the remains which they have left to posterity. How many ages must have elapsed before these primitive nations had reached a sufficiently advanced stage of civilisation to leave behind them any thing which we can call a monument! We have as yet barely arrived at the time, when men endeavoured to perpetuate their memory by the erection of stones arranged in a certain order. The periodical return of seasons taught them that nature moved in a given circle, and thus the circle appeared to them as an organic form—mystic and symbolical. Those gigantic structures, which are found in Great Britain (as at Stonehenge) and in Celtic Gaul (as Carnac), still furnish us with monumental examples of stones arranged on this circular plan, the centre being occupied with one or more monoliths. Nor is it only in the North and West of Europe that these ancient relics are found. Last year in the middle of an old forest of Schleswig, near the castle of Noër, I observed a monument well-known in the country, and which the inhabitants call " Kreis Gericht," that is to say, the Circle of Judgment. An enormous stone occupies the centre, and around it are placed a dozen stones forming a circle. The inhabitants regard this monument traditionally as a Council Hall, where the chief deliberations of the nation were formerly held. In the vicinity of this structure and in some large extent of land around it, a learned professor of the University of Kiel told me that from time to time tombs had been discovered, and that the skulls found in them differed essentially from those of any living race. Close to Kiel there exists an ancient Cromlech. The appearance of these monuments had led people hitherto to suppose, that they might be attributed to the Celts. But a few years since structures of precisely the same class were brought to light in Africa and in ancient Numidia. I have myself seen near Tarf, not far from la Calle in Algeria, on the borders of Tunis, a monument which reminds one of Stonehenge in miniature—the same circle of stones, and in the centre two upright stones, surmounted by a slab of the same material. Since attention has been called to these monuments, investigations have multiplied and they have been observed by hundreds. In the province of Constantine (the ancient Cirta) up to the frontier of the desert, they have discovered and dug up ancient tombs, and also come upon skeletons in good preservation—thanks to the nature of the climate. All these tombs, formed on the exterior a sort of circular mound, or tumulus. Here, then, we have in two quarters of the globe, and in countries utterly remote from each other, monuments which indubitably belong to the same race. It is not, then, only the Celtic family by which they must have been constructed. One must recognise also the Cimmerian races, which, in unknown times leaving the steppes of Scythia and passing from east to west, occupied Asia Minor during many ages and divided themselves into two branches, the one turning towards Europe and the other towards Africa, becoming perhaps the source of the Berber race, which does not belong to the Semitic. This circular form of tomb was perpetuated for ages. We see throughout Asia the tombs of Tantalus, of Aleates, besides other great tumuli of persons unknown. We see in Africa a type of tomb called " Christian," which is the common tomb of the Numidian Kings, as well as the tomb, called by the Arabs, " Medracem," supposed to be the tomb of Syphax. They are all of a circular form, surmounted by a cone composed of steps. This circular form was adopted by the Romans, and very celebrated examples exist at Rome in the mausoleums of Augustus and of Adrian, and in the tomb of Cecilia Metella, &c., &c. If we pass into India we see the Topes and Touppas (so well described by Mr. Fergusson in his valuable work, the " History of Architecture,") constructed on the same circular plan.

You see, then, how ages are linked together. Civilised art joins hand in hand with the art of primitive times. Man's genius gradually progresses; borrowing from the past a lesson for the present epoch. Nothing is without its result in antiquarian research. I shall not speak of the times when the genius of Greece came to develop that which Oriental art had outlived. There are enigmas still to solve; but we remit the task to men younger than ourselves.

PAPERS

READ AT

The Royal Institute of British Architects,

SESSION 1867-68.

USUI CIVIUM, DECORI URBIUM.

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MEMOIR OF THE LATE CHARLES FOWLER, Fellow,

By T. L. Donaldson, Hon. Sec. For. Corr.; Member of the Institute of France.

Read at the Opening Ordinary Meeting of the Royal Institute of British Architects, November 4th, 1867.

There are none, who have passed through the middle age of life, but must have observed how many qualities of mind, disposition, and taste there are, possessed by men in common, yet how few are the distinct peculiarities, which markedly distinguish one man from the other and raise him as a man of distinction and worth above his fellows. There are certain brilliant qualities, which charm and throw an attractive halo around the presence of some, and render them the favourites of the period; but it is the sterling worth of character in a man, which commands the respect and confidence of his circle, who will listen to him as an oracle and follow him as a guide. I wish to record some of the prominent characteristics of our late and valued friend, Charles Fowler, who in September last passed away from us in the full possession of his mental faculties, although debilitated in constitution after several years of suffering from bronchitis, which he bore with the meekness, resignation and sweet disposition of the true Christian. In his day, when in the full exercise of his energies, both of mind and body united, he was here a man of mark, and we cannot allow his memory to pass without the testimony of the value we set upon him as a professional brother. It is a duty, not without its difficulty, to allude unreservedly to the character of one so lately among us: for there are many susceptibilities to be respected, and great variety of opinion may justly exist as to the merits or demerits of every individual. But I believe that in regard to our friend, the frank reviewer of his life has nothing to fear: for he himself was so straightforward, so utterly a stranger to all false feeling, and so great a respecter of the plain truth, that he was always ready, when the occasion required, plainly to tell his mind—

"Nothing extenuate nor set down aught in malice."

Mr. Fowler was born in May, 1792, at Cullumpton, in Devon, and frequently used with great satisfaction to allude to the many noted artists, of which his favourite county was the birthplace, as John Shute, architect and painter, and author of the first known work on architecture in England, and who was sent to Italy during the reign of Queen Elizabeth, by his patron the Duke of Northumberland; Reynolds, Nollekens, Northcote, Haydon, Eastlake, Brockedon, Prout, and W. Cooke, Member of the Water Colour Society; and to this list we may, I think without assumption, attach that of our deceased colleague. The principal town of the French departments has a picture gallery, as you know, for one of its necessary establishments, and usually a room is set apart specially to receive the pictures, drawings, sculptures, or engravings of the native artists of the locality. If Devonshire had a like gallery she might doubtless by this time possess some fine specimens of the works of the famous Devonians whom I have named, and of her other men of genius in various departments of skill and knowledge, and thus keep alive the memory of her worthies in connexion with their native county.

He gained his first professional experience in the office and works of Mr. John Powning, architect and builder, at Exeter, to whom he was bound for five years; but it seems probable that he had less opportunity here of cultivating his taste than of acquiring practical knowledge in the technics of construction; for, generally, the provincial architects were not men of high qualifications, and if a work of importance was required to be executed, it was usual to send for a London architect. As soon as this term of his apprenticeship was expired he entered, in 1814, as a salaried assistant, the office of Mr. Laing, the architect of the Custom House then erecting, and who had extensive practice.

In order to estimate accurately Mr. Fowler's career, and the full value of his services as an architect, it is necessary for us to cast a glance at the state of the profession and of architecture when he entered upon his career, and the difficulties he had to overcome. If we do not take this retrospect, we shall be unjust to him, for although he was engaged in the successive changes, which arose during the more than thirty years of active practice, yet the progress of society, the advance of science and energy of vigorous minds have now outstripped that period, and left far behind many of the inventions and modifications, that then arose and were then important. Macaulay, in his Essay on the History of the Revolution, has a paragraph, which (slightly modified) is very apposite to this principle of judgment. "The very considerations, which lead us to look forward with sanguine hope to the future (*should*), "prevent us from looking back with contempt on the past. We do not flatter ourselves with the "notion, that we have attained perfection, and that no more truth remains to be found. We believe "that we are wiser than our ancestors. We believe, also, that our posterity will be wiser than we. It "would be gross injustice in our grandchildren to talk of us with contempt, merely because they may "have surpassed us; to call Watt a fool, because mechanical powers may be discovered, which may "supersede the use of steam; to deride the efforts which have been made in our time to improve the "discipline of prisons, and to enlighten the minds of the poor, because future philanthropists may "devise better places of confinement than Mr. Bentham's Panopticon, and better places of education "than Mr. Lancaster's Schools. As we would have our descendants judge us, so ought we to judge "our fathers. In order to form a correct estimate of their merits, we ought to place ourselves in their "situation, to put out of our minds, for a time, all that knowledge which they, however eager in the "pursuit of truth, could not have, and which we, however negligent we may have been, could not help "having. It was not merely difficult, but absolutely impossible for the best and greatest of men, fifty "years ago, to be what a very common-place person in our days may easily be, and indeed must "necessarily be."

In the first quarter of the present century our art was at a very low ebb. The long and dreadful struggle with France had absorbed all the nation's resources. We had no spare money to bestow upon architecture, properly so called. The Government confined its expenditure to buildings required for the commonest purposes, raised in the most economical manner and with ordinary materials. The speculative builder superseded the accomplished architect, and erected, for the nobility and gentry, rows of square boxes of brick or stucco houses as mansions, without any pretension to effective decoration or dignified aspect. Shut out from intercourse with the Continental Schools of Art, there were not half a dozen men of superior qualifications among the professed architects of England. The Chambers and the Adams of the eighteenth century had passed away, and only a very weak tradition of the merits and taste of those great men remained. James Wyatt, Dance, Soane, the elder Hardwick, and, not to omit, Nash, were at the head of the profession. Sir Robert Smirke had but just entered the field, afterwards occupying a position so distinguished and honourable to himself. The Grecian Wilkins had not yet made himself a name. Stuart's 'Athens' was opening a new phase of art, and Britton and the oldest Pugin were reviving the interest in our mediæval antiquities. But as for the literature of architecture it was almost *nil* in England. Mr. Laing and Mr. Joseph Kaye, men of elegant taste and amiable disposition, but not of vigorous temperament, were pursuing a successful practice; but not with very striking distinction: for their productions, however graceful in detail, were not powerful in general effect. There was, therefore, wanting in the profession an energy of effort and strong purpose to carry out noble ideas of the highest class; in fact it was rather suppressed than encouraged.

It is not necessary for me to pursue more minutely the analogy, or rather contrast, between this state of things fifty years ago and the present period. Where there was *one* architect *then*, there are *now* scores. They are no longer confined to the metropolis as the supposed centre of taste, they swarm in our provinces and our colonies. Men of determined purpose, well grounded in the practical as in the theoretical branches of our art: zealous partizans for this or that style: with brilliant imaginations, though not always correct: anxious, perhaps too much so, for novelty: but altogether presenting a teeming life of action, thought, and zeal for distinction. And this not merely in the narrow sphere of their country and the colonies, but ready to enter the lists with the wide world in the career of architectural competition. A chivalrous feeling like that of the belted knights of the middle ages, who wandered wide away in search of giants to overcome, or monstrous beasts to slay. It is for the stirring enterprise and the earnest effort for progress of the present period, that we are indebted to such men as our deceased friend, who with honest purpose was among the foremost of those in the race for distinction.

I have said that the publication of Stuart's 'Athens' opened a new sphere of taste, and it was the classic style which Mr. Fowler generally adopted; but he was a man of that independence of mind, who would conform to the canons of any style, only so long as they were appropriate to the object in view; he would not be bound down by them, but would exercise a liberty of treatment that most suited his purpose. The result of this was, that he was by no means a purist. This arose not from mere caprice, but from some innate conviction, that departure from strict rule was under such and such circumstance most effective, and not only justifiable but called for. His works, therefore, are marked by great liberty of treatment, evincing almost an indifference for the opinions of others, when he had the persuasion within him that he was right. It was while he was with Mr. Laing that he became acquainted with Mr. Kelsey,* the principal assistant in the office, and with our President, Mr. Tite, and Mr. Bellamy, Fellow, who were articled pupils, and the late Thomas Lee: and a mutual friendship arose which was never interrupted. And at this period also he received a medal from the hands of H.R.H. the Duke of Sussex, at the Society of Arts, for a design for a New General Post Office. At that time this was the only encouragement offered to the student, besides the Royal Academy Gold and Silver Medals; so that the Society of Arts' Medals were objects of some contention among the young architects. At present, however, the prizes offered for competition to the tyro are numerous and valuable; but unfortunately they do not seem in like manner to stimulate our juniors to exert themselves for their attainment, and this is much to be regretted. It is to be hoped that this may be attributed to other more lucrative occupations or objects of study of greater importance, rather than to indifference for distinctions, which cannot but be honourable and useful in their future professional careers. It is something beautiful and stirring to see a young man throw his whole faculties into his pursuit and work: to witness a determination and zeal and energy to attain his purpose: and to watch the glow of hopes, yet to be realised, beaming upon his healthful countenance and lighting up his intelligent eye. Our young friends may rest assured that the youth, who is not ambitious for distinction and not ready to stretch forth his hand to grasp the wreath of fame, offers little hope that he will in after times rise to that exercise of his powers or talents, which shall give him a lead among his compeers.

In the varied departments of construction of such a building as the Custom House, young Fowler must have had great opportunities for instruction and experience, the more particularly as Mr. Laing, who had other works in hand, and was of a somewhat indolent disposition, left to his able and enterprising assistants already named the main conduct of the works, in fact Fowler largely assisted in making out the working drawings.

Design for New London Bridge.

In 1822 architects and engineers were invited to send in Designs for a new London Bridge, the old one being found to be insufficient for the traffic, unsound, and a very dangerous obstruction to the water-course of the Thames. To Mr. Fowler's design, among the fifty-two competitors, was awarded the

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* Mr. Kelsey, who was subsequently Surveyor to the Commissioners of Sewers for the City, and a man of considerable talent, gained the Gold Medal at the Royal Academy, Lee the Silver Medal, and Mr. Tite and Mr. Bellamy became Students there.

first premium. He proposed to span the river with five segmental arches, in graduating widths, from the Middlesex to the Surrey side of the Thames, the centre having 145 feet span, the width of the piers 30 feet, total width of the bridge from out to out 50 feet, and the roadway not being level, but having a rise in the middle of several feet. I regret to say that the most minute research has not enabled us to lay before you the original design, the drawing of which is doubtless among the archives of one of the City authorities, and no copy can be found among the papers of our late friend; but I deduce these particulars from other documents. Two drawings, however, are now exhibited of other than the successful design, and which he submitted also, it is believed, in the competition. The one has five elliptic arches, graduating in width of 160, 150, and 116 feet, with cut-waters and niches to the piers, and open balustrade on the top. The piers are not solid but filled in with seven cylindrical rings of masonry, the centre one 37 feet in diameter, and lesser ones graduating from 13 to 6 feet in diameter, his active mind being always at work to introduce some new improvement in construction, and in this case lightening the mass to be borne by the piers and diminishing the cost.

The other design shews the varied manner in which he could treat the same subject. It consists of seven segmental arches, the centre one 105 feet span, and the other ones on each side respectively 104, 100 and 85 feet, the piers varying from 14 to 12 feet wide. The crown of the bridge rises 11 feet above the level at the sides, and the spandrils of the arches are filled in with a series of hollow transverse cylinders, similar to the other design, and the width of the bridge is also 53 feet from out to out, that of the roadway only 23 feet. But there is this remarkable feature borrowed, I presume, from the Italian examples or designs, as he proposes the foot passengers to have a covered way, presenting an arcade to the river face, and a colonnade on the inside; he arranges also that the top of this arcade should form a footway, and there are circular stairs at the ends of the bridge to afford access thereto, and thus providing for any extraordinary excess of foot passengers, for which the ordinary footway would not suffice. I will not stop further to analyze the designs he submitted, nor to consider whether the proposed width would suffice for the enormous traffic of this arterial thoroughfare and entrance to London; but we must recollect that railroads did not exist to reach the precincts of the Metropolis. Nor is it necessary to consider whether the proposed colonnades of the proposed footways might not present inconvenient obstacles for the free passage. But whatever the positive merits of the actual design were, it surpassed that of his competitors, and to it was awarded the first premium, and the labours of its author were crowned with this preliminary success. However, this first contest was succeeded by a struggle, which unhappily seems to be the wretched consequence of such competitions, arising from a difference of opinion as to the superiority of a successful project, whether originating in the Committee, in cliques of interested parties, or the profession itself, which too often, I am grieved to say, we have witnessed since then. The ultimate decision of carrying out Mr. Fowler's design was referred to the *disinterested* examination of a Committee of the House of Commons, a tribunal, as we know, quite as likely to be biassed by party passions, questions of interest, or the battle of styles, as not. Here it met the usual fate: a fresh competition was opened to a select number, from which the premiated author of the first competition was carefully excluded. This and similar decisions that have since occurred, give rise to very grave considerations on the subject of competitions and their results; and will, I trust, induce the profession as a body to take up the matter dispassionately and judicially, and to decide authoritatively the following leading principles among others:—

1. Whether, be it in an open or limited competition, when a *bonâ fide* honest decision has been arrived at by the body appointed to make a selection, it is competent for one or more of the competitors or others to endeavour to overthrow the decision, or assist those who seek to do so.
2. Whether any member or members of the profession are justified in attempting to disparage the

design or professional character of the successful candidate, in order to deprive him of the fruits of his fair success.

3. Whether the general principles of a competition be not rather to test whose design appears best, and to designate the man the most capable of carrying out the intention of the promoters of the competition, rather than to turn upon a servile adhesion to the regulations prescribed, or absolute perfection in the successful design.
4. The merit may be relative rather than positive; but should not the author of the best project be employed, as the architect of the work, with liberty to modify, alter and render his conception such, as to meet the original or modified views of the Committee or body delegated to carry out the building?

It will be perceived that in these propositions thus broadly enunciated, I do not enter upon the advisability of instructions more or less minute, precise and absolute, nor the extent to which they should go. My experience leads me to suspect, that ample and copious as they may be, it should be left to the discretion, and its consequences, of the designer to adhere more or less thereto. I feel convinced that such instructions are frequently ill conceived in some particulars, and absolutely pernicious to the proposed object, and harassing to the judgment of the architect, who, if left to his own more experienced or gifted judgment, might suggest possibly happier and more useful combinations and arrangements. Thus thoughts of rare value and many fertile ideas are lost, from the reasonable fear of want of success, if departing from the strict letter of instruction.

And perhaps I may carry your concurrence with me in the opinion, that a dual decision, as on a late occasion, is unjust to the competitors. It overthrows the essence of all competitions, which should be an absolute selection, and may leave the subject open to a fresh contest, when others may have the advantage of benefiting by the conceptions of the designs already submitted.

But in regard to such a competition as that of London Bridge, and the young and enterprising author of the best design. To the competitor the money-value of the premium, or even the reputation of success, is of far inferior consideration to that of having to execute such a work, and to associate his name with one of the most prominent erections of the metropolis. On this, his future fame and success and position in professional life may depend. To have carried off a prize for his design, and to be denied to carry it out, argues a want of capacity in some respect; for the public generally little know the antagonistic and petty interests upon which such an appointment turns. His hopes are crushed, and it requires the innate confidence of power, the independence and high-minded spirit of such a man as Mr. Fowler to enable him to rise superior to such a result; not to be depressed by it, but to go on with unrelaxed energy in the pursuit of his profession, and to regard the matter as a success partially attained, though not fully realised.

TOTNES BRIDGE.

His next engineering enterprise was more successful. The old bridge of Totnes, Devon, over the Dart, was tottering from decay, was of insufficient width, and its many piers obstructed the water-way. He was employed in 1826 to build a new one, consisting of three segmental arches, the centre opening being 60 ft., the side ones 53 ft., the piers a little more than one-fifth of the span, and there was one small side arch 33 ft. span, next the town, to relieve unusual floods. There were many difficulties of construction, but he was equal to them all, and now a handsome commodious structure replaces the old ruin as it were, and leaves ample space for the passage of the waters when rising to their fullest height. He often referred to this as one of his happiest efforts in every respect, and he was proud to have left this memento of his name in his native county.

Hungerford Market.

Mr. Fowler was gifted with a practical rather than an imaginative turn of mind. There are those who are endowed with such an abundant richness of imagery as to be able to pour forth a flood of original ideas, and thus delight and astonish by the wild profusion of their thoughts. But Mr. Fowler always bound himself within the strict limits of practicability and use. Not that he was without a certain degree of fancy, and often very happily made the accidents of a plot, whether in its shape or levels, contribute essentially, not only to the immediate purposes of a building, but also to the playful arrangement of his distribution. Of this we have a striking illustration in his Hungerford Market, now destroyed to make way for the Charing Cross Station. The want of a Fish Market at the West End of the town to obviate the necessity of going eastward to Billingsgate for the supply of the western part of London, induced a Company to be formed about 1826 for the purpose of remedying the defect; and the Central Plot at Hungerford was purchased, it being a necessary condition that it should be on the banks of the Thames. Those, who unconsciously pass along the Strand, rarely picture to themselves the high level at which this great thoroughfare passes above the bed of the river; and it is only the unfrequent wanderer along the Adelphi Terrace who can become aware that he stands some 30 feet above the high tide of the river. This sudden difference of level had its advantages and defects, but our friend converted its defects into picturesque and practical advantages, and by giving two heights of storeys to his Market he facilitated the classification of the sale of articles, and produced a very striking architectural effect with the colonnades and flights of steps. It would appear that although the proposal originated in 1826, yet several years were passed in modification of the designs, negociations for the purchase of the several plots required and generally in the promotion of the object. The area secured, independently of the wharf, was 126 feet wide, extending upwards towards the north 465 feet, and opening up into the Strand by a short access called Hungerford Street. This, therefore, presented a long narrow slip, with a rapid continuous fall from one end to the other. Next the river there was the wharf, about 200 feet wide, with an average depth of about 70 feet, and a flight of stairs down to the water. Towards the river the elevation presented two end pavilions, 31 feet 6 wide, to be occupied as hotels; and between there was an open court, 130 feet deep, having on each side two tiers of colonnaded galleries, 26 feet 6 wide, and the whole area of which was appropriated to the Fish Markets, having all the necessary conveniences. At a future period the centre of this court was covered by a most ingenious iron roof, protecting the fish stalls, and which for originality of treatment and ingenuity of combination was considered at the time to be a very clever piece of construction. It is published in Part I, Vol. 1 of our Transactions in the year 1836.

At the further end of this lower court there was a flight of steps leading to the upper level, and picturesquely combined with a fountain and basin, and abundant supply of water. The whole of the basement area was, as you may imagine, occupied by ranges of cellar, magazines and stores for the accommodation of receiving goods for the tradesmen in the markets above. On the first or upper floor there was a colonnade gallery uniting the pavilions with the central portion, and along this gallery were stalls for various trades. The flight of steps already mentioned led up to the Great Hall, which covered the central division of the whole plot. It extended to the depth of 160 feet by a width of 121 feet, and had three aisles, each 30 feet wide, divided by colonnades, which carried a clerestory, 43 feet high, and above was an open timbered roof. The side aisles to the right and left had ranges of shops, about 15 feet deep, next the external walls. This division was appropriated to the fruit and vegetable market. Beyond the Great Central Hall was another court, 140 feet deep, with colonnades on the sides, and butchers' shops, the middle being left open, and from it New

Hungerford Street led into the Strand. A dry statistical statement, such as this, may give you some idea of the general arrangement and of the accommodation afforded. But it cannot convey any notion of the playful picturesqueness of the group, where court rose above court, galleries above galleries, and where the series of roofs outtopped each other. Förster was anxious for it to appear in his 'Bauzeitung,' at Vienna, and as soon as it was published the Germans hailed it with great applause, and it was as well known abroad as at home, and perhaps still more highly valued. When Stüler and Strack, the famous Berlin architects, soon after visited England, their first desire was to visit Hungerford Market, which they had seen in the 'Allgemein Bauzeitung' with external walls only a German foot thick (1½ brick) carried up to a height of several stories, a fact which they could not believe until they saw it. This reveals one of the principles of Fowler's mind as to construction. "Enough for security and not more than enough. Extravagance is waste." This is an honest but somewhat dangerous maxim. This "enough" is a vexed question, and experimentalists vary in opinion as to what extent beyond the actual stress or pressure it is safe and wise to have the actual strength. Our friend's desire to avoid excess might perhaps induce him occasionally to venture too near the verge of mere sufficiency. But the whole of the construction was a very critical work. He had not only to uproot old foundations but to plant his building on the very strand of the river (*unde derivatur nomen*); which, narrowed from its original stream to meet the constantly encroaching and never-satisfied necessities of commerce, presented a bed of slush and silt and quicksand to a great depth; and of course he had to anticipate casualties and provide for a solid foundation. At one period one of the pavilions next the river betrayed a disposition to glide towards the water, to the great horror of himself and friends; he, however, adopted the suggestion of a brother architect, secured the mass by a long tie carried far back into the bank, and the would-be errant pavilion slightly settled down vertically to its set on the soil, and never afterwards troubled the architect.

COVENT GARDEN MARKET.

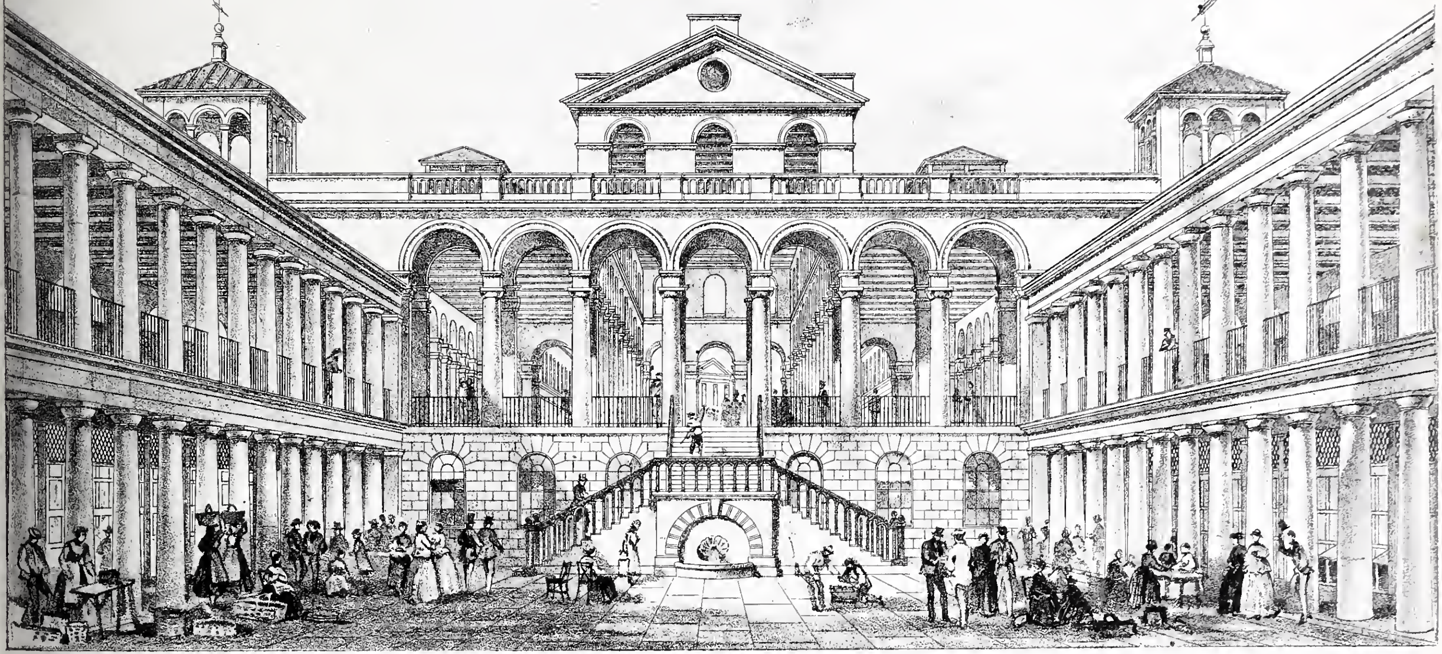
About the year 1826 Mr. Fowler was employed by the Duke of Bedford, owing no doubt to the reputation he had acquired in regard to his Hungerford Market design, to remodel entirely the area of Covent Garden Market upon an improved distribution and arrangement. It consisted then of sheds, hovels, and stands of the most ignominious description, without any order, method or arrangement, and mixed with stalls protected by tattered coverings or old umbrellas and greengrocers' trucks, presenting almost a scene such as those picturesquely represented by our Prout in his Views of the Market Places in front of the Cathedrals abroad. Our princely Duke, or his steward, had more respect for his rents than the public convenience, and even more than at present was access precluded on market days from Holborn to the Strand, between Drury Lane and St. Martin's Lane. Here was a fine scope and field for industrial reform to be taken by the House of Russell, and if the head of the house had had a comprehensive grasp (as probably his architect had) of the progressive developement of the population and wants of this end of the town, he would have doubtless adopted such broad views as those of the present Prefect of the Seine and his Imperial Master in the case of the Halles at Paris, and have contemplated the sweeping away of the whole area between Long Acre and Tavistock Street from North to South, and between St. Martin's Lane and Bow Street from East to West, leaving the Theatre and Church standing, and appropriating the vacant plot to the Market. Nor would it have been too much, for even now every market day the streets within those limits are clogged with waggons, market carts, trucks and costermongers' barrows, that block up the way and embarrass the passenger hurrying to gain the railway stations on either side of this bewildering and confused crowd. But in fact this should have been a municipal undertaking, and not the enterprise of an individual, however high in rank, and influential from the property he possessed in this locality. The truth is, that the West End of the metropolis has no municipal government. There are the feeble and ill-conditioned vestries for evil and for good, and there is the Central Board of Works with limited and ill-defined powers, and with no authority to undertake such operations as these except by special Act of Parliament. Where then are administrative control and management?

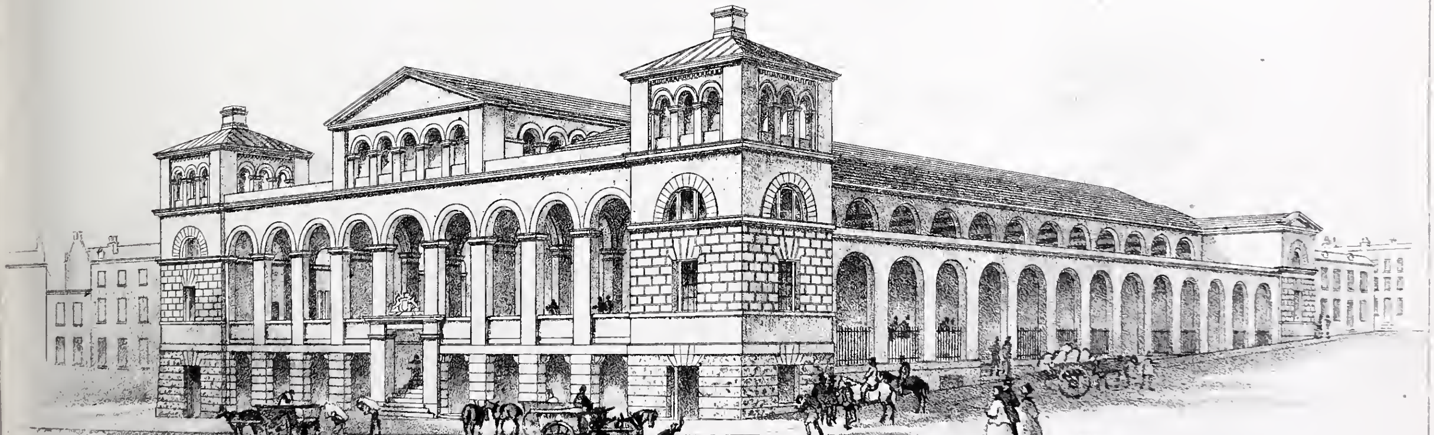
Cramped and limited as he was, our friend reduced chaos into order, and produced a group of buildings with a certain degree of architectural effect, making the most of the space afforded him. He has a central avenue from east to west, which however is hardly wide enough for the traffic, with ranges of shops on either side. He left two open areas on each side, and then introduced a line of shops to the north and south, flanked by colonnades of Doric columns of monolithic blocks; thus giving the composition an architectural aspect. The columns, as also other parts, were of his favourite Haytor granite, which he largely introduced into all his works, not only for the sake of solid construction, but to promote this rising industry of his native county. He arranged a gallery on the first floor at the east end for a conservatory, with a fountain and other accessories, so as to be out of the way from the general frequenters. But, much as he effected, his instructions did not leave him at liberty to give full play to the scope of his own ideas. He could not interfere with the existing properties around; he could not open new accesses, nor provide ample thoroughfares, as in the recent markets at Paris, which are so great an improvement over the ancient ones; he could not produce such lofty covered areas, nor introduce running fountains and ample streams of water to refresh the air and to aid in keeping the stalls and ways free from impurities. These are the improved ideas of modern times, and forced upon the convictions of the authorities; and it is to be hoped that the new series of markets rising up in Smithfield, under the direction of the able City Architect, will not leave us in arrear of our neighbours, who of late have been so ready to go ahead in all their metropolitan improvements, many of which we should do well to imitate, and if possible to excel.

EXETER MARKETS.

In order to complete the subject of Markets, so many of which Mr. Fowler erected in different parts of the country, as at Gravesend, Tavistock and Exeter, I shall anticipate the chronological order of his professional career, and proceed to notice those for Exeter, the result of a competition in 1834. There were to be built the Higher and Lower Markets, for the former of which Mr. Dymond gained the premium, and Mr. Fowler that for the Lower; but Mr. Dymond dying soon after he had commenced his work, Mr. Fowler was appointed to succeed him, and carried them both out. Certain imperfections were found in some of the arrangements of Mr. Dymond's design, which Mr. Fowler was directed to modify, but the design for the High Market generally was carried out as contemplated by its author. The general block of the lower Market consisted of an area about 127 feet wide by 188 feet long, and this was covered, much in the same manner as in the Hungerford Market, by a large Hall or Meat Market, divided into three aisles, with enclosed shops next the outside walls on one side next Market Street, and by a Corn Market next Milk Street on the other. At one end next Guinea Street the façade occupied the whole width of the block, presenting an imposing series of nine arches two storeys high, flanked by end pavilions, whose upper storey rose above the general level, as did also the central division of three arches, which, however, is not sufficiently large in scale for so important a feature. At the other end, next Fore Street, where there is an entrance of limited width, this central feature is repeated with more breadth and bolder proportions. In section the three aisles are covered by roofs of graduated heights, the central one rising up above the side ones, and having a framing of arched ribs with happy effect. On this occasion Mr. Fowler devoted much attention to the fitting of the butcher's and other stalls, and

HUNGERFORD MARKET (AS ORIGINALLY ERECTED)





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EXETER LOWER MARKET.

substituting light iron standards and frames for the usual bulky posts and rails, rendered the general appearance of the market more light, cheerful and cleanly. This practical attention to minute details was one of the characteristics of his turn of mind. Mr. Fowler, who had always a feeling for works of high art, induced the authorities to strike a medal commemorative of this Market; as did also the late Mr. Bunning in the City of London. Is is to be desired that all architects would act in like manner.

CONSERVATORY AT SION.

In 1827 he was engaged in designing and constructing a Conservatory at Sion, near Brentford, for his Grace the Duke of Northumberland. The princes of that house are accustomed to carry out their ideas on an almost regal scale, and when we consider that this was erected forty years ago, ere Kew or Chiswick or the Botanic Gardens were in embryo, one cannot but be surprised at the imperial development, as it were, given to this Conservatory. It presents a total width of frontage of 230 feet; the central or tropical house is in the form of a Greek cross, each arm of which is 38 feet wide and 21 feet deep, and presenting a total width and depth of 80 feet. The intersection of the arms at the crux is surmounted by a glass dome 38 feet in diameter, and rising 50 feet above the level of the garden. From the central mass quadrant glass galleries branch forward on either side to the right and left, and lead to the end wing-conservatories, which present an elevation of 40 feet in width. This graduated series of conservatories, varying in dimensions of width and height according to the nature of the plants under cultivation, affords a pleasing and graceful composition, and reflects great credit not only on the munificent conceptions of the Duke, but upon the taste and skill of the architect. It was at the time unique, and led to his employment for many years afterwards in various works for the Duke. By the graceful kindness of the present Duchess the conservatory and grounds were thrown open last summer by cards to known friends of the family and their connexions. It is to be hoped that the privilege will be renewed next year, and that in time the public generally may be able to enjoy the gardens and noble conservatory of Sion. Among the ancient Romans the patricians and emperors often left their gardens in legacy to the people, and to this allusion is made by our immortal dramatist, in the celebrated speech of Anthony over the dead body of Cæsar:—

> "Moreover he hath left you all his walks,
> His private arbonrs and new-planted orchards
> On this side Tiber; he hath left them you
> And to your heirs for ever; common pleasures
> To walk abroad and recreate yourselves.
> Here was a Cæsar: when comes another?"

It approximates to this generous principle, when our nobles throw open occasionally their parks and grounds to the enjoyment of the public.

HONITON CHURCH.

In 1835 we find him engaged upon the Church of Honiton, in the Lombardo Norman style, covering an area of about 106 ft. by 60 ft., exclusive of a tower at one end 20 ft. square at the base, rising 98 ft. 6 to the top of the pinnacles, and having at the other an apse projecting about 15 ft. from the general face of the wall, and forming the chancel. The interior has a central nave 23 ft. wide, separated from the side aisles with their galleries by seven arches, surmounting circular pillars 2 ft. in diameter of slender proportions having Norman caps, above which rises a clerestory. The whole height of nave from the floor to the ridge of the ceiling being 43 ft., and of the side aisles 28 ft. A fall in the level of the ground towards, what we call, the east end enabled him to form a crypt, affording the accommodation of a large room, 29 ft. by 24 ft., for parish meetings, and an adjoining vestry, 13 ft. 6 square, for the clergy. The arrangements you will perceive are judicious and the proportions imposing. From what we have already observed of Mr. Fowler's character we cannot but conclude that he was extremely cautious, patient in the consideration of his subject, and not apt to be led away by capricious fancy. Yet he had the ambition to try new points in construction, to distinguish himself by the introduction of iron, then newly adopted, and by the combination of unusual framing in carpentry to produce new effects—but not without the most laborious investigation. There are some plodders who care not to wander from the beaten path, or to strike out new ways for themselves. On the contrary there are others, who, anxious for novelty and distinction and led away by the thousand and one so called inventions of the day put forward by quacks and adventurers, are ready to adopt them, and thus run risks unjustified by experience, in the hope of effecting something new and striking. For the errors on both sides we may admit some indulgence; the timid may avoid involving their employer and themselves; the daring may discover some new desirable method advantageous to their employer and creditable to themselves. Mr. Fowler was not a man of these extremes, and yet there was a rashness occasionally about him that involved him in difficulties. However, he was, as I have said, a man of calm deliberate purpose, cool temperament, and not moved by mere impulse. Yet he recollected the glories of the vaulted cathedrals, such as Exeter, under whose shade he had passed so many of his younger years, and possibly he was stimulated by the successful daring of Savage, who had recently spanned the nave of Chelsea New Church with a groined stone vaulting, and had acquired great credit by the work. He determined to cover the nave of Honiton with a ceiling and roof in one, which should give him height, be of fire-resisting construction, and of a material that should, as far as possible, bid defiance to weather and decay. The means at his disposal did not admit of stone, so he threw a series of ribs of cast iron across the opening between the clerestory walls, with spandril ribs at the ends, divided the intervals between each into panels, filled in with tiles and cement. In point of solid construction nothing could be sounder, and for materials nothing more enduring; one condition, however, was unforeseen, the action of temperature on the mass.

The church was completed and very much admired, and after consecration the services proceeded as usual, but in a short time streams of water were seen on the ceiling and to run down on the clerestory walls. Surely there must have been some cracks, some settlements, and the rain had entered; but it was noticed that the same symptoms occurred in cold dry weather, when there was no rain, and at length, after much painful enquiry, it was found that the very density of the materials of the roofing, rendered cold by the outer atmosphere, condensed the hot vapours arising from the many hundreds of the congregation, and thus produced streams of wet, which either, as I have said, ran down the ceiling and walls or fell in thick drops on the heads of the worshippers below. Our friend, in spite of his habitual caution, had forgotten, in attempting to rival the construction of the architects of old, that there was no building but had a roof over the vaulting, rising with high pitch, which gives so much dignity and solemn grandeur to our mediæval edifices: but which, although it contributes to the artistic effect, is primarily intended to guarantee the vaulting beneath from inevitable decay, or condensing vapours when exposed. This, as you may imagine, was a cause of deep trouble to Mr. Fowler, as also of considerable expense to him, for he was obliged by an inexorable and unpitying committee to bear the cost of rendering the ceiling watertight by an ordinary roof superposed.

How different the fate and responsibility of the civil engineer. He may try in the endeavour to study the interests of his employer, new schemes, adopt different expedients. If they succeed, well and good, but if not, the onus is not thrown upon him, his clients are ready to incur the risks of efforts undertaken for their advantage and carried out with a vast expenditure and labour in good faith by the professional man in whom they trust.

Devon County Lunatic Asylum.

About 1842 Mr. Fowler erected a Lunatic Asylum near Exeter for the county of Devon, for the reception of 450 patients. This was the result of a Public Competition: half a dozen of the best of the projects sent in were selected, being by C. Fowler, S. A. Greig, Scott and Moffatt, J. Hayward, Knowles, and W. Moseley; all, but one, the names of well known men, and, after a severe scrutiny as to the accommodation afforded by each, and estimates of the probable cost, the selection fell upon the design of the subject of this memoir. The Plan is upon the radiating principle, a system once much in reputation, but as to Lunatic Asylums now superseded. It used to be considered that in Prisons and Lunatic Asylums, where concentrated supervision is of the utmost importance, it could be most economically and efficiently carried out by making the lines of Buildings and Courts radiate from a common centre. Our Milbank Penitentiary was the first erected on that principle in England.

The centre of the general Plan of the Devon Asylum is occupied by a Court of Administration, circular at the further end, and 220 ft. deep by 200 ft. wide. In the centre of this Court is the Building of Administration, with the domestic offices: the stables, coach houses, workshops, laundry, &c., being placed in buildings connected with the projecting wings, which are in prolongation of the horns of the main central arc. This main central arc consists of two storeys having next the court arched corridors, which open into day rooms, 30 feet by 20: six radiating wings, having a total length of 170 feet and 23 feet wide, diverge from this central arc. These wings consist of long galleries for exercise 10 feet wide, and of single or grouped dormitories for the patients opening thereto. At the end of the galleries the diverging wings expand to a width of 47 feet by 20 feet wide for larger dormitories and rooms; staircases are placed at the inner ends of the galleries for the patients and officers, affording immediate access to the several parts. The wings and central arc produce five recreation Courts, enclosed on three of their sides and open at the other, so that the country is open to view from the galleries, and the day rooms especially. For the main purposes of inspection and concentration nothing could be more successfully elaborated, and we may consider it as a perfect model for the radiating principle of plan. But since that period, an amiable and therefore pardonable but almost morbid consideration of the condition, treatment, wants, and I may say enjoyments of the victims of this sad class of disease, has arisen in the public mind, and especially in the ideas of the benevolent medical men, who have devoted themselves to the treatment of this malady. A complete revolution has taken place in the system, upon which Lunatic Asylums are now planned, so that the carefully considered arrangements of the Devon Asylum must now be considered a thing of the past and a more extensive distribution is adopted, entailing necessarily a much greater expenditure, but whether with more satisfactory results it is not for me to say. The cost of the building and fittings did not exceed £100. a patient.

London Fever Hospital.

Among the many curious anomalies of our social condition there is not one so apparently unaccountable, as the total absence of all legislation to provide for the prevention of the spread of infection, or the reception and cure of those among the lower stratum of the middle classes, who may be casually struck down by disease or visited by some serious accident to the body. This has been left to the sympathies of benevolent individuals, and the institutions which have arisen, whether hospitals, infirmaries, dispensaries, or asylums (except those for the insane), are wholly due to the expansive generosity of the public. These have been partially, but still not sufficiently provided for, and day by day new claims are presenting themselves for immediate attention and relief; and so inadequate are the funds and income of many, left unheeded by our *parental* system of Government, that yearly and other spasmodic periodical appeals are obliged to be made, in order not to arrest the Samaritan exertions of committees, nor leave the hospitals deeply in debt to their honorary treasurers. An instance of this occurs in the Fever Hospital, without which contagion might rage among the poor and carry off thousands of victims ere it could be arrested. Near King's Cross, London, there was a combined establishment for Small Pox and Fever Patients. The irrepressible railway system intruded into the suburbs of London, and the plot was required for the Great Northern Railway. The site was consequently purchased up, and through the influence of his constant friend, the Earl of Devon, Mr. Fowler was employed to prepare a design for the Fever Division. He would, of course, rely much upon the technical requirements suggested by the medical staff, and having satisfactorily provided all the peculiar necessities of such an institution, the building was erected to contain about one hundred and fifty patients, male and female. I need not trouble you with a detailed description of the plans and elevations as they are exhibited before you, but I must call your attention to the adoption here of double parallel wards, communicating with each other, and which arrangement has to a degree been introduced by Mr. Bellamy, our Fellow, at King's College Hospital. Upon the advisability of such an arrangement much difference of opinion exists both in the medical profession and our own.

Wax Chandlers' Hall.

He was a member of the Wax Chandlers' Company, and ultimately its Master when his turn came. Under the Mastership of Jos. Pulley, Esq., he erected, in 1852, their Hall, situate in Gresham Street West, and which is in fact one of his last works. The plot which it covers is of moderate dimensions, giving a frontage of only 40 feet, and a return elevation of about 47 feet. He treated it in a simple unaffected style, yet with some effective features; and the entrance vestibule, staircase and dining hall afforded him opportunities for some graceful decoration, well worthy of the institution. The importance of its general external aspect is, however, much diminished by its immediate proximity to the imposing and sumptuous mass of the Goldsmiths' Hall, designed and executed by our Fellow, Mr. Hardwick, who has so nobly on the exterior, as well as within, conveyed the impression of the wealth, influence and transactions of the Goldsmiths, who hold the foremost rank among these corporate guilds of the City of London.

Undismayed by the disappointment of the New London Bridge, or want of success on other occasions, Mr. Fowler, with a perseverance and spirit peculiar to him, entered upon many other competitions, both open and select, as for—Salters' Hall; King's College, Cambridge; Christ Church, Woburn Square; Fishmongers' Hall; the Scot's Church; Fitzwilliam Museum, Cambridge; the Monument to Sir Walter Scott, Edinburgh; and the re-building Oxford Market. And he carried off the second premium for the Bridge at Littlehampton; and for the Nelson Monument, Trafalgar Square, in conjunction with his friend, Mr. Sievier, the sculptor. He held the appointments of Architect and Surveyor to the Amicable Society, and to the West of England Fire and Insurance Office. He was largely employed by Sir R. Lopes, the Bishop of Exeter, Mr. Courtenay, and his father the Earl of Devon, who proved throughout life to be his firm friend and very influential patron, and for whom he executed considerable alterations and additions to his Lordship's Castle of Powderham, near Exeter.

Among his ecclesiastical buildings he erected the Chapel at Kilburn, Middlesex, and for his father-in-law, the Rev. Dr. Crane, S. John's Church, Paddington; a Church at Charmouth; and rebuilt and enlarged the Church of Bickleigh, Devon, for Sir R. Lopes. All except the first of these are of the Mediæval style, and Mr. Fowler, considering this to be the prevailing taste of our country ecclesiastical buildings, and consequently having many associations connected with our religious feeling, he held this to be ordinarily the most appropriate class of art. But he did not deem it to be *exclusively* adapted to the purpose. Why should not the Reformed Church of England adopt the revived architecture of the fifteenth century? Why should the Bible-enlightened principles of the present be carried back to the monkish legends and ritual of the twelfth? We may still have, as the leading feature of our plans, the holy symbol of our faith—the Cross, whether of the Eastern or Western Churches, the Greek or Latin, to which some among us look with such loving wistful eyes. But still the revival presents its domes, its towers, its spires, its pinnacles and arcades, and lastly its columns and piers for the interior; which, however graceful in picturesque richness of effect, need not be there introduced so as to intercept the view or deaden the hearing, as too often occurs in our Gothic propensities. Our friend would have preferred the vindication of that great principle of the Reformation, liberty of thought and action in due subordination to propriety and truth, and not requiring our sacred architecture to be bound down by the fetters of clerical rule.

Mr. Fowler was one of the founders of the Institute, and so early as 1836 was my colleague, as one of the joint Honorary Secretaries, to the duties of which he devoted much attention, keeping in due order and regular method the accounts and ordinary business, which daily increased, thus greatly relieving me, my more especial division being the direction of the literary and artistic proceedings of the body. He continued to be Honorary Secretary for many years, and subsequently was elected Vice-President. He was a man of singular method and high honor, and of great transparency of character. He had great firmness and decision of character. His yea was yea, and his nay was nay. His active mind left him no rest. If the saying of the Great Roman Emperor is to be admired—*nulla dies sine lineâ*—what shall we say of our friend, whose maxim was *nulla hora sine lineâ?* Up to the last days of his existence he was constantly arranging and revising old sketches, and making new ones: monumental brasses was one of his recent occupations, and he made a fine collection of such memorials. As a Director of one or two of the Welch Lines of Railway, he was a valuable member of the boards of direction by his methodical business habits and thorough understanding of every responsible position that he undertook. Within a few weeks of his death, spite of suffering and weakness, he was engaged with his colleagues in travelling for some days, examining the various connecting links of the net of Cambrian Railways, and in the consideration of such a combination as should bring into play the South with the North, and thus produce a direct and unbroken line of communication between Milford and the centre of England: whilst thus engaged he caught a severe cold from exposure, and this probably hastened the crisis in his shattered state of health.

Gentlemen, I trust that I have not abused your indulgence, nor have unreasonably trespassed upon your patience in this review of the life and works of one, whose talents I admired, for whose character I entertained the greatest respect, and whom I valued as an attached friend. It would have been inexpedient to allude to every work on which he was engaged, I have ventured, therefore, to touch only upon the principal ones, and upon topics connected with the leading events in his life, which I knew were revolved over and over again in his own mind, and to which he devoted much thought. In fact they are mixed up with the professional life of us all, and it is well that they should occasionally be brought forward and left to dwell upon our memories and rivet our attention, and thus, perhaps, lead eventually, in this age of progress, to some satisfactory conclusion.

THOS. L. DONALDSON.

Mr D wishes particularly that the passages alluding to himself, & which he has erased, may be omitted

The Chairman, Mr. CHARLES BARRY, Vice-President, having invited remarks from the members on the paper just read,

Mr. EDWIN NASH, Fellow, said, no doubt there are others present who knew Mr. Fowler better than I did. He was in large practice when I was young, but I remember him well in this and at other places; and his Hungerford Market made a great impression upon me. But I rose to allude to an act of kindness which I experienced from him within a short period previous to his death. I wanted some information respecting the Custom House, when he not only gave me the facts I required, but also a description, and even made drawings for me, which I had not asked for. I thought it so kind and graceful an act on the part of a man advanced in years and retired from the profession, that the recollection of it leads me to observe that intercommunication between ourselves as architects, is one of those pleasing things which we should endeavour to cultivate, for it is not only useful in our profession, but it is also gratifying to our feelings simply as men.

Mr. GEORGE GODWIN, F.R.S.—There are so many texts opened to us in the paper that they would afford matter for at least half-a-dozen sermons. I have, however, no intention to go into those texts myself, but there are one or two points on which I would say a very few words. One is, that I am not able to agree with Professor Donaldson's statement, that there is a difference of opinion amongst medical men of the present day as to the advisability of having double wards, side by side, in hospitals; anything more preposterously bad than such an arrangement as that cannot be conceived. I speak from long consideration of the subject, and knowing the opinions of many of the most eminent medical men upon it. With such, and connecting the corridors, and as they usually go together, it is impossible to prevent the existence of hospital atmosphere, which is highly detrimental to the recovery of convalescent patients. It is not too much to say that in many of the older hospitals they have died more rapidly than they would have done if they had been placed under a hedge, covered with a blanket and decently fed. That is the well-known opinion of men of long experience in the matter, in which I fully agree. I should myself be sorry if the expression in the paper, guarded as it is, should lead to the belief on the part of any architect that, if he submitted to a committee a plan including double wards, side by side, it would stand a chance of being selected. I have no hesitation in taking upon myself to say that no such design would be selected. I laboured for several years in inducing a knowledge of the advantages of the Pavilion principle in hospitals, and I am happy in the belief that the double ward and corridor system would not now be admitted. With regard to competitions: I was glad to hear Professor Donaldson's suggestion—that the instructions to architects, instead of being more precise should rather be more open. It is a very difficult thing, I know, to obtain a decision with open conditions that will give satisfaction to all, but I am quite sure that instructions of a general character are best calculated to bring out the talents of architects, and more likely to lead to the production of good buildings. The restrictions under which architects are usually placed preclude the exercise of their own opinion and judgment in any case. It is of the utmost importance that the Institute should take this matter up and discuss the four propositions which Professor Donaldson has laid down, with the view of arriving at a more general understanding in respect of competitions. Some improvement might be effected towards this by the profession themselves. There is, as we all know, a great disposition on the part of unsuccessful competitors to cavil and find fault, too often with justice; nor is there any alteration in this respect, when the committee or municipal body call in professional men to assist them; the only difference in that case being that the referees get abused instead of the committee. The latter are likely to feel, that they may as well exercise their own judgment and allow local prejudices and favouritisms to have their weight, because there is the same abuse, whether impartial persons are called in or not. I would say, let competitors at any rate give their professional brethren credit for honesty of purpose and intention, until dishonesty is proved to exist, and not assume a "job" when there is not the slightest pretence for doing so, or the least evidence of the fact. I would, in conclusion, say one word with reference to our excellent friend the writer of the paper. I know no man so ready ever to come forward to bear testimony to the good qualities and abilities of a fellow labourer, whether he be alive or dead.

Mr. M. DIGBY WYATT.—It is my good fortune to have known the colleague we have lost for upwards of twenty years. I have seen most of his principal works, and I confess they all impressed me, as my personal acquaintance with him did, with a profound respect for his character, both as architect and man. There was a degree of sterling truth and good sense, of originality, of energy, tempered with sound discretion, manifested alike and equally in his life and in his works,—a straightforwardness of purpose of which any architect might be proud, when shown so uniformly, persistently and conscientiously. Professor Donaldson has dwelt principally upon the architectural aspect of our late friend's character, scarcely touching upon the domestic phase, in which it was my privilege to know him well. Happy in every relation of life, he was a man to be respected in all things, and from every piece of professional business, small or large, with which he was connected, he never issued, to the best of my belief, without carrying with him the respect of his employers, and the esteem of those who laboured either with or under him. Permit me, Sir, to explain to you that I came here this evening, as probably many others here present have done, with a double motive, viz.—to pay a tribute of respect alike to the memory of Mr. Fowler, and to the generous and large-hearted exertions of Professor Donaldson. I beg to indorse all that my friend Mr. Godwin has said in that behoof: and I feel perfectly certain that the thanks of the Institute can never be given more warmly to any other member of our body than they will be now to Professor Donaldson.

The CHAIRMAN.—Mr. Godwin has anticipated to a great extent the terms, on which I have now to ask you to accord your thanks to Professor Donaldson. It is impossible for any gentleman who has attended this Institute, either for a long or a short time, not to coincide entirely with what Mr. Godwin and Mr. Digby Wyatt have so well expressed. I am sure we shall all join in the hope expressed by Mr. Godwin, that some of the points of professional interest, which have been adverted to in the paper, may become subjects of consideration amongst ourselves.

The vote of thanks having been passed by acclamation,

Professor DONALDSON rose and said, I am very much obliged to you for the kindness with which you have received the proposition of my excellent friends, who have been too partial on this occasion. If I had yielded to my own feelings, I should have said more about Mr. Fowler and the valuable qualities he possessed, but I feel assured he would not have wished me to say one word more than what others might be disposed to accept; and I have avoided treating of his private character, because there was so much in his public and professional career,—such integrity, high honour and straightforwardness,—that I felt there was in that career alone, sufficient to occupy your attention for this evening, as I hope and believe, with interest and not without instruction. There is one topic which has not been alluded to, that is with respect to the younger members of our profession. I have written a few words which I hope may come home to them, to induce them to exert themselves more—to infuse more energy into their studies, and lead them to sympathise in the feelings with which we look upon our art, and in which we do expect more from them than they have yet done. I see before me some young members of our body to whom, at least, these remarks do not apply. I wish all our young members would take an example from them—that they would see how much they are respected, and how much we look to those, who are to come after us, to supply the places which we leave vacant, and not only do honour to their profession but to their country.

The Meeting then adjourned.

THE RELATIONS OF GEOLOGY WITH ARCHITECTURE.

By Professor D. T. Ansted, M.A., F.R.S., F.G.S., &c.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, November 18, 1867.

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§ 1. Introduction.—Constructive material is so important, not only in the practice of architecture, but as affecting the nature of designs, that every department of knowledge capable of throwing light on the nature and properties of such material, cannot but be worthy of the attention of the architect. No one who has watched the progress of art and the history of architecture, can fail to perceive the influence of material. Granite was a fit material for Egyptian temples; marble and the white stones of the South of Europe, especially Italy and Greece, are the best materials for expressing classical feeling and style; the coarser and warmer tinted stones of Northern Europe lend themselves much more to gothic forms; while the grand constructions of the low countries, and other places where brick is easily to be had and stone is scarce, exhibit a style of their own derived from the constructive material, or, at any rate, growing side by side with its general use for less important buildings. No excuse then is needed, when I presume to occupy your time this evening with some account of the nature and position of those materials, with which all architects have so much to do. If it were merely a matter of curiosity and general interest, the subject would deserve your notice, but involving as it does grave practical conclusions, it demands your most earnest attention. In addition to that knowledge of material, which every educated person should possess, the architect will find it eminently useful to know the composition, the mode of formation, the position in the earth, and the mode of quarrying all the principal varieties. It is precisely this knowledge that geology teaches.

§ 2. Origin of Constructive Material.—Most of the materials used for building purposes, have been originally deposited as mud or sediment from water. They consist, therefore, of fragments and grains of various substances, water-worn and water-carried, at first heaped together confusedly, and afterwards converted into clay or stone of various kinds. Of some stones, the component parts, whether calcareous or siliceous, are small and of uniform size, and the grain of the stone is fine. In others, they consist of concentric layers of carbonate of lime round a minute nucleus, the stone being formed by the cementing together of a vast multitude of these egg-shaped particles, each not much larger than grains of sand. In others they are larger, and include among them many fragments of shells of marine animals. In some they contain entire shells or corals, or even consist entirely of these organic bodies cemented together, and either changed in their texture or entirely replaced by carbonate of lime or silica, having the form of the original shell. Even where the strictly mechanical character of the deposit is not proved by this evidence, it may be inferred by the way in which the particles are aggregated. They are in horizontal beds separated by some bands of different character to the others; or, they are associated with such horizontal beds above and below; or, they are mixed with rolled or angular fragments of other stones, the whole being cemented in one mass. According to the mechanical condition in which they are found, these materials are of finer or coarser grain, and more or less adapted for certain purposes. When we know how they were formed, we may form some idea as to how they will behave under given circumstances.

But there are varieties of stone that have certainly not been formed in this way. The stones called lava and basalt are little more than slags, such as run out from an iron furnace. They are natural glasses formed by the melting together, in the interior of the earth, of certain earths and fluxes. They are sometimes in layers, but this is only because of successive outpourings at different times. Owing to their hardness and brittleness, and the irregularity of their fracture, they are quite unfitted for ornamental work, and could not be used for most architectural purposes; although sometimes valuable for foundations and for certain kinds of rough work, they are little considered and altogether unimportant, in a practical sense, to the architect.

But there is a large and most important class of intermediate materials, of the greatest use to the architect, and of which the origin is by no means so clearly made out by a mere inspection. While many stones, exhibiting their mechanical and aqueous origin, are easily recognized, and those which have been poured out from volcanoes in a fluid state also tell their history without difficulty, these intermediate substances, partaking to some extent of the peculiarities of both, are referred sometimes to one, sometimes to the other. They include the finest qualities of marble and alabaster, and the various granites and porphyries under whatever names they are spoken of. All these belong to a class spoken of by geologists as *metamorphic*, having undergone change or metamorphosis, which has masked their original character and communicated their essential characteristics.

We thus have all rocks, yielding constructive material, grouped under three general heads, as *aqueous*, *igneous*, or *metamorphic*, these names describing their origin as determined from their appearance. The stones in common use as free stones, are manifestly aqueous in their origin, but are generally somewhat metamorphosed. The stones used for ornamental and decorative purposes, such as all kinds of marble and many porphyries, are easily recognised at once as metamorphosed. Those stones, which are certainly and directly due to the action of intense heat sufficient to produce fusion, are rarely valuable except for road material. They are always too hard and generally too brittle for building stones. They also present an inconvenient and irregular natural fracture, ill-adapted for reduction to definite forms.

§ 3. VARIETIES OF CONSTRUCTIVE MATERIAL.—The mineral composition of rocks is in some cases very simple and evident, in other cases moderately complicated but easily recognised, in others again, so complex as to need long experience or chemical analysis to determine its nature. As the enduring power of stones, when exposed to certain influences, depends in some measure on mineral composition, this subject is one to which the architect should direct his attention.

A large proportion of the building material in common use is limestone, more or less pure, and the rest is chiefly sandstone. In the former case carbonate of lime, in the latter silica is the chief ingredient. Clays unaltered are only used when manufactured into bricks, and the sulphates of lime (gypsum and alabaster) are chiefly adapted for internal use or small ornaments. The granites and porphyries are limited to special uses, owing to their extreme hardness. The varieties of marble may be regarded as varieties of limestone. Slates and slabs are very useful in architecture, and form a special class of rocks due to metamorphic action and derived from clay.

Limestones are either simple carbonates of lime, mixed carbonates of lime and magnesia (magnesian limestones), silicates of lime and magnesia (serpentines), or sulphates of lime (gypsum and alabaster). According to their texture, to the cementing medium in the case of the bedded limestones, and in others to the extent of crystalline action or metamorphosis they have undergone, they are available for special purposes. They owe their colour to metallic oxides. When semi-crystallised and having a grain too fine to be recognised, they are marbles of the common kind, gypsum or serpentine, according to their chemical composition; when perfectly crystallised, they are statuary marbles or alabaster; when the grain can be recognised, they are generally free-stones; when the grain of the stone is mixed with fragments of shell, they are rag-stones or shelly limestones; when the grain is formed by a multitude of round concentric particles like the roe of a fish, they are *roe stones* or *oolites;* when the stone is compact, the stratification evident, and the stones split readily, they are *flags*. To all these varieties local names are attached in different districts.

The limestones in common use in England for architectural purposes are of several distinct kinds, the Portland stones, Bath stones, and many others belonging to the oolites; several semi-marbles of very compact grain derived chiefly from rocks of the carboniferous system, the mixed carbonates of lime and magnesia almost entirely from the Permian rocks on the borders of Derbyshire, Nottinghamshire, and Yorkshire, known as magnesian limestones, and some hard varieties of chalk. Elsewhere, especially in the south of Europe, the cretaceous and tertiary limestones are developed into admirable free stones of exquisite colour, very compact and almost non-absorbent. In Italy especially, are found the limestones called *tufa* or more properly *calcareous tufa** derived from the exposure of waters containing a large quantity of carbonate of lime. On the evaporation of the water the carbonate of lime is deposited in a form more or less compact, according to the material on which it is thrown down and the slowness of the deposit. Some very useful building materials are thus obtained, but they are limited to those localities where very large quantities of mineral waters run over the surface. In limestone caverns, and in veins in limestone rocks, the irregular drooping pendants or stalactites, the floor called stalagmite, and the lining walls of the veins are formed in the same way; but the floor is often very compact and may be used as a marble. Oriental alabaster is of this kind and it is very abundant in Egypt.

As well from their chemical composition as from their physical peculiarities, there are few building stones anywhere that excel the finer qualities of Portland. Their great drawback is, that they are heavy and expensive. The ordinary oolites of which the variety is very great, but of which Bath and Caen stones are the types, are sometimes round and good, wearing well and being obtained in very large blocks. Many of them on the other hand decay almost immediately. Their colour and texture is generally excellent, and they cut with the greatest facility, so that for internal work they are unrivalled. Some of them are singularly uniform in their oolitic structure, some are crowded with fragments of shells with only a few oolitic portions, and some parts are quite crystalline. According to their nature and composition they are more or less durable, and more or less affected by ordinary atmospheric influences.

The magnesian limestones, generally more crystalline than the oolites are in proportion to their crystalline state, valuable building materials. They are heavy and hard but work well. The great objection to their use arises from the extreme irregularity of their composition and texture in the quarry.

Sandstones are more simple in their composition than limestones, as they vary only in the grain or magnitude of the particles of which they are composed, in the nature of the cementing medium, and in the extent to which they contain foreign impurities. There are no crystalline sandstones adapted for architectural purposes, and the metamorphosed sandstones are too hard to be treated as free stones. The colour of sandstones is due chiefly to oxide of iron, which renders them yellow or red according to circumstances. The material of all sandstones is silica.

There are many admirable and more very indifferent sandstones used in the British Islands for architectural purposes. The red sandstones, abundant in the middle of England, and continuous geologically from Devonshire into Lancashire, are soft, cheap and very convenient, but they are rarely durable. The hard grey and micaceous grits of the carboniferous series, both of Yorkshire and the

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* Another kind of tufa (volcanic tufa or tuff) is also common in Italy, but it is of no value for building purposes, except as replacing pozzolana. It is volcanic ash, cemented by carbonate of lime, carried in by rain-water. The material under which Pompeii was buried is of this kind.

South of Scotland, are far superior in all respects; less absorbent, and more durable under all circumstances of exposure. Sandstone, however, is not very convenient for ornamentation, nor, indeed, are the bedded varieties well adapted for delicate sculpture, but for certain styles of composition they afford every advantage. The public buildings of Edinburgh and Dundee show good proof of this.

Clays I do not propose to consider in detail on this occasion. They can only be used for constructive purposes when manufactured into bricks. They are all silicates of alumina, varying in quality according to their mineral composition, but the quantity of alumina necessary to form a sound brick is exceedingly small, and the useful proportions are almost indefinite.

Gypsum and alabaster are pure crystalline sulphates of lime in somewhat different mechanical conditions. They are neither of them in the state in which stone is originally deposited. They are found sometimes in veins, sometimes in bands of nodules of large size.

Among very useful material in countries, where it is abundant I ought not to omit mention of the soapstones (silicates of magnesia) which in their quality of resisting fire are excelled by none. America yields them very largely and at a moderate cost. They are found in Cornwall, but large blocks for building could not, I believe, be obtained of uniform quality and in sufficient quantity to be used extensively. The gritstones of the carboniferous system are the best stones that can be used for fire-proof buildings.

Granites of all kinds belong to the class of metamorphic rocks. They were certainly not deposited as they now are, nor were they brought into their present condition by any action of mere heat. Originally, perhaps, of mechanical origin, they have been rendered crystalline by long continued chemical action, assisted by intense heat and enormous pressure while in the interior of the earth. In this way have been produced, not only the peculiar state of the mass of the rock, but the fissures and their varied contents, the veins of metalliferous and other matter that penetrate them, and all the changes they induce in the other rocks adjacent. Rocks of this kind are double silicates.

Slates, once thought to be crystalline rocks, have been produced from clays by mechanical pressure. The fissile character can be given to wax, or to any other substance whose particles are sufficiently minute; and all the varieties of colour and texture, all degrees of fissile nature, all the peculiarities of hardness and resistance may be distinctly traced to the mechanical cause of the phenomenon. It requires, however, a careful examination of slates in the quarry, and some habit of examining slate quarries, to appreciate the fact that they are so nearly allied to clay pits, and that so narrow a line separates materials apparently so very different. I say nothing here of the shales, which are transition rocks between clay and slate, nor of the limestone flags such as Stonesfield slate, neither do I speak of such paving stones as the Yorkshire flags. These hardly belong to architecture, though occasionally used in construction, and though of different material they are formed in the same manner as slates.

§ 4. MODE OF FORMATION OF VARIOUS KINDS OF STONE.—It is not enough for the architect to be told that the various materials used for construction have been derived from other rocks, partly by mechanical disintegration, partly by chemical action, that they have been deposited at the bottom of the sea, and that they have been altered by heat and chemical action. All these are important facts, but the evidence on which they rest, and the conclusions derived from a consideration of the whole matter, are also in the highest degree valuable to the practical man. The architect should know the nature and history of the formation of stones, if he would make the best use of such of them as come under his notice.

Limestones, sandstones and clays of all kinds, have been at one time held in suspension or solution by water. They were for the most part deposited from moving water, though sometimes separated on evaporation, as in the case of calcareous tufa and cavern incrustations and stalactites. This is the case with the carbonates of lime very clearly and certainly, with the sulphates less clearly, and with the double silicates of lime and magnesia, or serpentines, least clearly of all.

It is only after much doubt and discussion, that the latter have been distinctly recognised as metamorphic limestones. Even now the Italian geologists recognise, and perhaps with reason, certain erupted serpentines. In all cases the change or metamorphosis will be found to be extensive and very complete, and the ordinary characteristics of limestone entirely lost. Till very recently, fossils or remains of organic bodies, such as are almost always found in limestones, had not been observed in serpentines, and even now the steps of conversion or metamorphosis are rather guessed at by the chemist than traced by the geologist. So also the mechanical origin of sandstones of all kinds and of clays, is seen at once by a very slight examination of the stones, but the subsequent history of all these rocks is not so readily made out.

After the deposit in the sea of mud or sand, brought down by rivers from mountains and various lands, and mixed with the detritus obtained from the disintegration of cliffs, this raw material of rocks remains exposed for a long time to the action of water, by which means a certain mechanical arrangement of the particles must take place, according to their relative specific gravity. During this time also a large quantity of remains of plants and animals cannot fail to have been introduced. In some places the whole mass may consist of corals or shells, of bones of fishes, of scales or even of the exuviæ of animals, in others fragments only are retained, and in some there will be casts of such objects, the original having become decomposed, or markings and impressions sufficient to prove the existence of organisms, even when no actual fragment remains.

The next step in the conversion of accumulated heaps of mud and sand into definite strata of stone, is that of consolidation. There are two ways in which this is brought about, one mechanical, the other chemical. Mechanically, wet mud parts with superfluous water and is converted into a compact mass by mere continued pressure. There are always foreign substances present, which under favourable circumstances will act as a cement, and the solidification is usually effected by carbonate of lime, aluminous earth, or oxide of iron, held in solution in the water and discharged under chemical action. Occasionally silica, in a dissolved state, answers the same purpose.

The work that is thus effected requires time, and during this time a process of re-arrangement of particles generally takes place, so that in the beds or strata now formed, the impurities and foreign substances are separated from the mass, and accumulated in nodules or layers; whilst the drying takes place there is always contraction, and thus many fissures and clefts are produced. They are often filled up by crystallised plates of the same material as the mass. In this way are produced certain varieties of limestone, but not those common in England. The English calcareous building materials belong to the oolites, in which the grains themselves before being cemented together by carbonate of lime, have been curiously formed by numerous concentric coats of much smaller particles. Of these there is a great variety, some being white, compact and heavy, such as Portland, others cream-coloured, soft and light, as Bath, and many of intermediate character and of different value. No two stones from different quarries have precisely the same qualities, inasmuch as the conditions under which stones have been formed cannot have been exactly the same in two parts of a coast line. The oolitic grains are believed to have been formed in water very slightly agitated, enabling each grain to become a centre of solidification.

The magnesian limestones (carbonates of lime and magnesia) are combinations of carbonate of lime and carbonate of magnesia, more or less crystalline according to circumstances. When the two carbonates are nearly in equal proportions, and both well crystallised, these stones are eminently compact and fine grained, but owing to their nature and mode of formation this condition is apt to be partial, and in this case the quality of the stone is irregular and uneven, and it weathers badly. The cause of the association of magnesia has not been very clearly made out, nor is it essential to the architect to enter upon this question. It is certainly the result of change after the original deposit, and in so far belongs to metamorphic action, but at what part of the history of the deposit the magnesian element is introduced is still open to discussion.

Marbles of all kinds are crystalline limestones. Many of the coloured varieties are so little changed that their mechanical origin is evident, and they are loaded with organic remains. This is not the case with statuary marble, nor with the white granular marbles, extensively distributed in certain localities. These are veins consisting of slowly crystallised material, filling up crevices or fissures made in limestone. They are perfect in proportion to the completeness of the metamorphosis, and the removal of all foreign substances. The higher qualities are thus few in number of deposits and small in quantity. The inferior qualities are abundant and varied.

The varieties of marble called serpentine, are double silicates of lime and magnesia. They are often extremely beautiful, but owing to the mode in which they have been produced, they are crossed in every direction with threads and streaks, and are much cracked. It is very rare that large slabs can be obtained of uniform quality for decorative purposes, or that blocks of length enough are found to serve for columns.* The mode of formation of these rocks is not easy to see, but they have been rendered what they are by change long subsequent to deposit.

All the varieties of granite, all the veins in granite, and all the numerous porphyries, must also be regarded as metamorphic. They were originally aqueous rocks, but they have been completely changed in all essential characteristics, in combination with water under great pressure, and exposed during a long period of time to high and uniform temperature. The peculiar construction of these rocks, as crystals embedded in a kind of glassy paste, does not appear to be the result of strict igneous fusion, as was once thought. It is rather the result of the action of chemical force assisted by time and high uniform temperature. Having been formed in this way, the result is a stone of extraordinary compactness and durability, but at the same time extremely difficult and costly to deal with. Porphyries are comparatively little affected by weather, and are often of extreme beauty. But every large mass of granite rock is interpenetrated by numerous dykes, representing fissures in the first formed mass subsequently filled up by similar accumulations of crystals embedded in a glassy paste, but as these have been formed under somewhat different conditions, they are always more or less compact, and have special properties. Thus a large mass of granite in the quarry varies greatly in different parts, sometimes being hard and tough, sometimes decomposing rapidly, and sometimes passing into a fine granular state quite different from the ordinary rock, and more fit for road metal than building material. Thus are produced infinite varieties of granite and porphyry, varying in hardness, in grain, in durability, and in facility of working, from the comparatively soft kinds quarried in Cornwall to the glorious specimens of Rhodonite that have lately been exhibited in the Russian department of the Great Exhibition at Paris.

It almost follows as a necessity for the actual conversion of mud into stone, that all accumulated masses of this kind should have been deposited at or conveyed to some considerable depth below the common surface of land and water. The pressure of a heavy column of water, and the equable and increased temperature of the interior of the earth, must always be taken into account in considering their origin as rocks, and their subsequent history. But as all the stones with which we have to deal are now above the level of the sea, and some of them many hundreds, others even thousands, of feet above it, a further change derived from their mechanical upheaval must have acted upon them. Whatever may have been the nature or mode of action of the upheaving force, it cannot fail to have acted unequally on the different kinds of material. Thus it must have squeezed the softer kinds and crumpled them into folds, broken the harder and more brittle varieties, and cracked and fissured all exposed to its influence. The upheaving force also having not only acted unequally, but having been limited to certain lines of direction and areas, the rocks in certain places have been tilted up at a high angle, while in some spots they have been lifted so uniformly as not to show much evidence of fracture. The action of water percolating the more porous rocks and the fissures has always gone on, and has generally assisted, though it may sometimes have checked, the mechanical action of the upheaving force. This also must have been greatly modified by the mechanical position of the rock. Many disturbing forces have continued for a very long time, they have been always exceedingly slow, and periods of upheaval have generally alternated with periods of subsidence and long intervals of repose. Thus all the materials have to a certain extent interpenetrated each other, and they have been exposed while all this was going on to such chemical action as must happen when water percolates through minerals and groups of minerals of different kinds placed under conditions favourable for change. These conditions are much more numerous and varied than was once thought, and provided time enough be allowed, there seems nothing in the way of modification of the position of the elements that may not have been accomplished.

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* I have lately seen in the island of Corsica, a material of this kind, hardly inferior in quality to the finest varieties of *verde antico*, and capable of supplying both slabs and columns of very large size. Specimens of it have been used in the Emperor's box at the new Opera House in Paris.

§ 5. Weathering and protection of Stones.—The effect of exposure after the material composition of stones has been determined by original deposit, and subsequent change, is generally described as *weathering*. This effect varies exceedingly under different circumstances. It varies with climate to a marked degree. It varies with position in reference to the sea, and also with reference to prevalent winds and compass bearing. It varies with the amount of shelter and the position in the building. The rainfall of the locality affects it seriously. Town and country exposures, even in identical climates, are very different in their influence. Thus durability for building purposes cannot be determined without many considerations and much observation. It can hardly be determined at all in a short time, for many stones that resist destruction at first, and for some years, afterwards decay rapidly, while others that seem very poor at first become almost permanent when certain early and inevitable results of exposure have been produced. It is evident that this subject is one of the greatest practical importance, for whatever be the colour, texture or aspect of a stone, however easily it can be procured, however cheaply it may be worked, its value must depend on its power of resisting the weather; and it cannot be denied that wind and rain, heat and frost, are powerful agents constantly at work, and they tend, if not to reduce the stone to its elementary mud, at least to test very severely its powers of resistance. Thus the architect must study stones in the field and in the quarry, if he would know how they will appear after a few years in his building. There is, however, another effect of exposure, and of an opposite kind. Most stones harden by weathering, and thus, a material that cuts in the quarry like cheese may, if properly used and sheltered for a while, become a very useful material. Our neighbours, the French, have a practice of making a complete facing of thin planks or laths in front of buildings in progress, by which means their soft but beautiful white stone facings, as well as the decorative work, is kept free from the direct action of the weather for some months at least. This practice is thoroughly in accordance with reason, and might be copied by us in England with great advantage, especially in the atmosphere of London and other large towns. It is, however, likely to be most efficacious in a dry climate.

In a natural state stones are rarely exposed to weathering except in the two positions of approximate parallelism to the plane of stratification, and at right angles to that plane. The surface of the ground represents the former, and the face of a marine cliff or quarry the latter. The surface of the ground, when nearly horizontal, is often so far sheltered by the accumulation of soil that it offers no evidence of the relative durability of the stone underneath, although under certain circumstances, when the rock is moderately hard and there is little cultivation, a great deal may be learnt by careful local investigation. This is especially the case with hard stones, such as granite and certain varieties of gritstone. It must be remembered that the minimum of weathering takes place when a vertical section of stone is exposed, and the maximum when the slope of the bedding is considerable, and tends to carry the drainage out on the vertical face laid bare. Thus a cliff does not necessarily exhibit the weathering, especially as the natural process of destruction that takes place in all cliffs takes place to a great extent by undermining and eating away soft beds at intervals, and thus letting the hard and little weathered bands of stone fall down, leaving an unweathered or little weathered face.

The nature of weathering, and the kind of injury stones suffer by exposure, is not difficult to understand. All building stones in common use are fissured, to some extent porous, and partially soluble in pure water. They are still more easily acted on when the water contains minute quantities of mineral acid, either sulphurous acid, liberated in the atmosphere on the burning of coal containing sulphur, or carbonic acid derived from animal or vegetable life. Carbonic acid gas is always present in the atmosphere, and sulphurous acid cannot be absent in the air of towns; thus, whenever rain falls and is driven by wind, water containing acid enters the exposed surface of stone. Once there it cannot but dissolve a minute part of such soluble minerals as exist in the stone; it eats away the surface, or it destroys the cementing medium, or it carries away the thin bands that occur between insoluble parts. Thus there is and must be direct chemical action, to some extent, on the occasion of every shower that falls. In a climate like that of England, where rain is frequent, this action is considerable; it is most considerable in such parts of the country where rain is most frequent, and in such aspects as are most exposed to the rainy and prevalent winds: thus a south-west exposure is the worst everywhere in England, and the western parts of our island are generally worse off than the eastern. But as the sulphurous acid is chiefly confined to places where much coal is burnt, towns are worse off in this respect than the open country; large towns are worse than small towns, and manufacturing towns worse than those where there are fewer chimnies. On the whole, London, Manchester, Birmingham, Leeds, Newcastle, and Liverpool, are among the worst of all, because of the vast extent of area covered with houses, and as being places where most coal is burnt.

But there is another source of destruction independent of this: alterations of temperature involve expansion and contraction, and as water attains its minimum volume at the temperature of about 39° F., any frequent changes above and below this limit cannot fail to disintegrate any surface of stone exposed to it. All stones are more or less absorbent, and are cracked at the surface, although the fissures are often very minute; into the stone by absorption, or by these fissures, water penetrates, conveyed by that principle of suction which gives to the sponge its peculiar properties. Cooled down to the smallest volume when the external cold approaches the freezing point, any rapid change above or below the temperature of greatest density must produce sudden expansion, and this in its turn involves disintegration; thus every frost does something to destroy the surface of exposed stone, and the more delicately it is sculptured the more rapid and complete the destruction must be. The public buildings in the University of Oxford afford examples of rapid disintegration that are exceedingly striking, owing to the poor quality of the stone used; but all our buildings exhibit it more or less clearly, Buckingham Palace, built of Bath stone, having been perhaps as much injured as any. The Houses of Parliament, so often referred to, are, in certain exposures, and with regard to certain stones, in a very bad condition, owing to a similar cause; but the greater part of this building is really as well preserved as can be expected, when it is remembered that the stones were admitted without selection, were taken from quarries before untried, and were for the most part made use of in the building shortly after being taken from the quarry. On the other hand, St. Paul's Cathedral and Greenwich Hospital, built of Portland stone, are specimens of the minimum of injury from exposure, the stones having been selected and worked in slowly. Many parts of Westminster Abbey are in a very indifferent state, and perhaps some of the restorations in Bath stone, not long completed, are as bad as any. On the other hand, the Geological Museum in Jermyn Street is very perfect, chiefly owing to care taken in the selection of the stone. It is to be hoped that the selection of material to be used in the new Law Courts will not be left altogether to the accident of a contractor's interest, as has sometimes been the case, or to the want of agreement between the architect and the Government, as was the case with the Palace at Westminster.

But the subject of the weathering of stone is in itself suffitiently extensive and important to justify a separate and elaborate memoir. It is a subject also that is very urgent, for there cannot be a doubt that all causes of deterioration are more energetic in recent times than formerly, owing partly to the great rapidity with which work is carried on, and partly to the increasing quantity of deleterious gases present in the air. A stone that may be safely used in one place, would rapidly decay in another, and a stone that with care and attention might be very durable, might turn out to be a complete mistake for the want of these considerations. The case requires that the chemist should combine with the geologist, and both must possess much practical experience before any valuable conclusions can be drawn.

Much may, however, be done by careful investigation, to determine the relative value and probable enduring power of different kinds of material. A definite method, known as "Brard's method," introduced by a French chemist of that name, was at one time much resorted to. By boiling limestones in a saturated solution of sulphate of soda, and subsequently crystallizing the salt within the stone, some idea was obtained of the relative enduring power of the more absorbent stones. There are some practical reasons why this determination has been found in certain cases incorrect, and it is not now much resorted to. Very careful and minute local examination, not only in the quarry, but in the laboratory, a consideration of the behaviour of the stone, when exposed to acid vapours, and a knowledge of its geological history, will give useful suggestions; but the best stone used carelessly will be a failure, and a very inferior material carefully treated, may turn out very well. No stone can be regarded as free from injury on exposure, and granites, as well as soft limestones, need examination before they are employed for purposes where permanence is important. In treating of this part of the subject, I must not omit to mention the well-known report of Sir H. de la Beche, and the other Commissioners for selecting the stone for the Houses of Parliament, for it must not be supposed, that because the material has not turned out well, that this is necessarily the fault of the scientific and practical men who prepared this report. It must still be regarded as the best summary of knowledge concerning British building stones.

The method adopted by the Commissioners in this enquiry was, I need not remind you, to visit the principal quarries, take samples of the stones, examine various buildings constructed of the material, and make a physical investigation and chemical analysis of the samples. They omitted what was, perhaps, most important, a consideration of the probable behaviour of the stones, when used in a London atmosphere; believing that if a stone would resist exposure in a country village, it could be trusted everywhere, The result has proved that such is by no means the case, but notwithstanding this, the report and references remain of great value. As you are in possession of an admirable series of specimens of the stones examined by the Commissioners, selected by Mr. Charles Smith, whose intelligence and knowledge of the nature of material were well known and fully appreciated by all who had the pleasure of being acquainted with him, I can only recommend the study of these specimens to all who would obtain an idea of the resources of England in freestones of all kinds. The report has, I believe, been reprinted. It should be in the office of every architect.

An account of the various modes of resisting the destructive process of weathering, belongs to another department of geology applied to architecture, on which I must say a few words, but on which I must also touch very lightly, for here also chemistry and geology must combine to secure useful results, and the facts are too numerous and too important to treat of at the end of a communication already expanded to some length. Various processes have been recommended and adopted for the purpose of protecting the softer and more absorbent stones, especially limestones, from weather action. They have been applied very often after a building has been completed, and is already partly injured, and I fear we must all admit now, that under such circumstances very little permanent good can be done. Two very distinct classes of treatment are recognised, one being the application of an oleaginous skin, which will resist moisture as long as it resists oxidation, but not a day longer. Paint is of this kind. The other is the deposit within the substance of the stone, or on its surface, of some non-absorbent mineral, by a process of double decomposition. Of this kind are numerous contrivances, invented and patented, and some of them well known. The method of Mr. Kuhlmann, of Lille, involving a wash of silicate of potash or soda, called water glass, soaked into the substance of the stone, and forming a silicate of lime by slow decomposition and replacement, was the first commencement of a series of appliances of the same general nature. Perhaps the most simple, the most rapid, and the most economical, is that patented by Mr. Frederick Ransome, formerly of Ipswich. According to this, the deposit of a coat of silicate of lime is secured by following a wash of the soluble silicate of soda, by a wash of chloride of calcium. A double decomposition immediately sets in, and while on the one hand a very insoluble silicate of lime is rapidly thrown down to coat each atom of the stone that has absorbed the first wash, the chloride of sodium formed by the elements set free, is highly soluble, and can be removed by washing with clean water. I believe that this method if applied to Bath stone, or even to the less good porous limestones of the oolitic series, before any change has taken place, and before the stone is used in a building, they would be improved perhaps to the condition of good Portland. Such a result is no trifle, and would amply pay the expense incurred. Mr. Spillman has recently patented a method of coating by the aid of phosphate of lime believed to be well adapted to porous limestones.

I am aware of no method that could be depended on, to convert the inferior absorbent sandstones, more or less mixed with marl, into really good grits. Almost all sandstones are very absorbent, and houses and public buildings built of them, are apt to be damp if the surface be not protected. Silicate of lime affords probably the best protection when the stone is otherwise sound.

§ 6. CEMENTS.—The subject of cements is also within the province of architectural geology. Of ordinary material, it is enough to mention common mortar, a substance varying much in quality, not only according to the way it is made and managed, but with the lime used for burning. The French architects and engineers have gone perhaps more fully into the theory of manufacture than the English, but I need not remind you that there are as many varieties of lime as there are of limestone. All mortar, worth anything, improves and strengthens by age when not destroyed by disintegration and weathering, and the fat varieties or pure carbonates of lime do this the most slowly, though at the same time more efficaciously. All admixtures of silica, of silicate of alumina, and of oxide of iron appear to act mechanically, and when they reach to a certain per-centage, they tend to convert the lime obtained by burning into hydraulic lime, which sets more or less rapidly, according to its composition. The composition of pozzuolana or volcanic dust is such as to form an admirable hydraulic cement, perhaps the best when mixed with fat limes instead of sand. It is not my purpose to detain you by accounts of so well known a material, but I wish to point out that some geological knowledge will often greatly assist the practical man in deciding on the material he shall use for certain definite purposes. Thus nodules (*septaria* as they are sometimes called) are very common in certain clays, and are particularly valuable. The geologist in the selection of such material will be a useful aid to the architect, for whenever a material of special quality is needed, either for common mortar or for concrete, it is clearly important that the lime should be obtained, if possible, from the neighbourhood. It is only by knowing the peculiarities of the limestones that the proper admixtures of foreign substances can be made to secure the best result.

Among cements, terra cotta, and artificial stones may be included. There are many varieties and some of them are very much used. Terra cotta as used in ancient times by the Greeks and Romans was unquestionably a material of great importance, but the great difficulty of counteracting the unequal shrinking consequent on burning has never been quite overcome. The best modern manufactures in this material for architectural purposes are, however, very good, as may have been seen in the recent Paris Exhibition. A material of a very different kind put together rapidly and finished without burning has been introduced and is now being manufactured by the Siliceous Stone Company. Its adaptability to architectural work has been well shown by some gigantic capitals of columns sent to Calcutta for the University recently constructed. Its value as an enduring material, thoroughly safe in case of fire, may, I think be safely assumed, and if it could be provided at a cost sufficiently low to compete with other imitative stone there could be little doubt of its general use.

§ 7. CONCLUSION.—I am unwilling to trespass longer on your time, in continuing these illustrations of the intimate relation of geological science with architecture. They are so numerous, so varied and so important, that the time at my disposal would be exhausted long before the subject. On the principle that every intelligent person making use of a substance on a large scale, would desire to learn as much as possible of its history and nature, should be able to look for it in the right place, to use it in the right way, and to manipulate it properly and economically, I have assumed that you who practise architecture should be interested in stone. I have therefore ventured to point out briefly, the principal directions in which the study of stones may assist in the practice of architecture.

Mr. BENJAMIN FERREY, Fellow.—May I beg, on the part of the meeting, to express to Professor Ansted our obligation to him for the very able and instructive paper he has addressed to us? It is a subject into which it is impossible for us to follow him in all the various matters touched on. It would require a long time to discuss them, all deserving deep study and consideration; but at the same time, it would be wrong to allow any discussion to take place, without expressing at the outset our best thanks for this able discourse. I will not prolong my remarks further than by saying that I think it is a paper which cannot be discussed this evening, and that a future evening should be devoted to its full and proper consideration. I have great pleasure in now proposing that we tender our best thanks to Professor Ansted, for his very admirable and interesting paper.

Mr. EDWIN NASH, Fellow.—If I may presume to second the motion, I should like to do so, and to make a few insignificant remarks, for after such an immense amount of very accurate knowledge as that which has been displayed before us, we ought, I am sure, to feel highly grateful to Professor Ansted for coming here this evening. The question has often occurred, of what value is geology to the architect? and the answer, not by myself but by others, has been, that it can be of little use to us when we see that the great men of our art, such as Sir Christopher Wren, Sir N. Chambers, and a host of others, whose works we can scarcely hope to surpass, did without it, and to whom, in fact, geology was scarcely a known term. I think, however, that such an argument is a very shallow one, inasmuch as we must open our minds to the lights which arise as ages pass on; and I am sure that geology is a science opening to us such stores of useful thought and information, that we ought not to neglect it, even if we only follow it, as I have done as an amateur; and even if we only derive from it that enlargement of mind which is engendered by the sublime truths which it reveals, yet in connection with architecture it is so useful, that we can never regret having spent even a large amount of time on such a study.

There are many practical points connected with this subject, which require our consideration, and I will allude to one, namely—fire-stone. Little has been said in the paper on that point, but as there is a probability that many fire-resisting buildings will have to be erected in London, under a new Act of Parliament, it would be a very valuable thing, if Professor Ansted could oblige us by pointing out those kinds of stone which would more perfectly resist fire than other kinds. The Reigate stone, though a good fire-resisting material, is not such a stone as we require. It is of lighter specific gravity than most other descriptions of stone, and it will not bear great weights, besides being otherwise unsuitable. We want a stone applicable to most of the purposes in a building, and one that is able to carry a heavy weight, such as the end of an enormous girder in a wall, and yet when the building takes fire, will not disintegrate by the heat. I am not myself acquainted with stones which are fire-resisting like the Reigate stone, but taking a name or two at random, I would ask whether the silicio-calcareous stone of Tisbury, in Wiltshire, is likely to be better than other kinds, or whether the blue [Pennant] stone, which is found near Bristol, is one of that kind or not? Information on these points would be exceedingly useful to us, so that when we want fire-stone, which is strong as well as fire-resisting, we may know where to go for it. It will be recollected by some, that there was another kind of fire-stone in the market some years ago, which was prepared by saturating the stone, from the neighbourhood of Tunbridge Wells, with a resinous solution, whereby it was rendered literally a fire-stone, inasmuch as it was highly inflammable. I remember a man coming to me with it, and my telling him that his stone would burn, which he contradicted, but on putting his specimen in the fire, after five minutes it flared up like an oil lamp, and nothing was left of it but a little powder. I must say with regard to the examination of quarries, as recommended by the Professor, that whenever we can find the time for it, it is a most valuable amusement, and that there are many things to be thus learnt which were not expected. Take the common material, chalk, which is so largely used; it is interesting to find out its nature in the quarry. One which I examined at Glynde, is largely used for lime. Southwards of London, some beds there contain four per cent. of clay, and make a good mortar; some have fourteen per cent. of clay, and make a strong hydraulic lime. But there is a bed of the same quarry in which, the proprietor informed me, there is as much as fifty per cent. of clay, and when burnt it makes so strong a cement, that the moment water touches it, it sets with such vigour that they can do nothing with it, and it is useless. Perhaps the Professor's opinion can be given on that point. I beg, in conclusion, most cordially to second the motion which Mr. Ferrey has made.

Mr. Ferrey.—I have some facts which I could bring before the meeting, but I feel it would be premature to enter upon the discussion of a subject of such large importance at this late period of the evening. It was for that reason I proposed that we should offer to Professor Ansted, in the warmest manner, our thanks for the able paper he has brought before us, but not with a view to prevent discussion. I am glad to hear what fell from Mr. Nash, and I have no doubt other gentlemen could offer observations on the same subject; but I consider it would be unwise to enter into the discussion of a subject of such large and varied significance, at this period of the evening, and I believe, if it is adjourned till a future occasion, members will come down with important information bearing on the subject brought before us this evening.

The Chairman.—We must, I am sure, feel delighted and thankful to Professor Ansted, for the admirable and interesting paper he has read ton-ight. It is of that real value to architects which requires a good deal of consideration and thought, and I am satisfied it is impossible for us to enter into the full details of the subject brought before us, and to make up our minds satisfactorily, merely from the hearing of the paper read, as it has been this evening. It requires a study of some time at our own homes, and I think it would be, as suggested by Mr. Ferrey, a most desirable course to defer to a future evening the further discussion of this subject. If that meets with your views, I will now put to the meeting the motion which has been made by Mr. Ferrey and seconded by Mr. Nash, that we give our most cordial vote of thanks to Professor Ansted, for having read to us the paper this evening. And then I would suggest that the further discussion of this subject be adjourned till the 16th of December.

Professor **Ansted**, having acknowledged the compliment paid to him, said—before the Meeting closes I would say one word with regard to what has fallen from Mr. Nash, who alluded to two subjects more especially, which I can answer as well now as I could do at the final close of this discussion. With respect to stones that resist fire; I suppose there can be no doubt whatever that the better varieties of sand-stones, more particularly the Craigleith and the grit-stones of the coal measures are beyond comparison the safest and best, wherever anything of this kind is needed. The expense may no doubt be some consideration, but these stones are not expensive in themselves, and no doubt they might be used wlth advantage where they can be procured at a reasonable price. In the west of England some of the other stones mentioned by Mr. Nash might answer the purpose, but I think there is too much lime in them to make them a safe material to resist fire altogether. There can, I think, be little doubt that the stones from the coal measures are the best in England for this purpose. With regard to the question of limestones containing an exceedingly large per centage of foreign matter; I think there is no question that there are some descriptions fit for burning containing as much as 50 per cent. of foreign material. I believe many limestones, useful for hydraulic limes, contain as much as that, and I do not think it matters much what the foreign material is; it rather depends upon what state it exists in the limestone whether it makes good hydraulic lime or not. Generally speaking these limestones which contain foreign matters, distributed in exceedingly minute forms, are well adapted for all hydraulic purposes. I shall be happy to be present at the meeting to which it is proposed to adjourn this discussion, and to say all I can in answer to those points which may be then brought forward. I cannot of course enter into matters of practical architecture, but as far as the discussion bears upon my department of science I shall be happy to speak to the best of my ability.

The Meeting then adjourned.

MURAL DECORATIONS AT THE MANSION OF SIR WALTER TREVELYAN, BART., AT WALLINGTON.

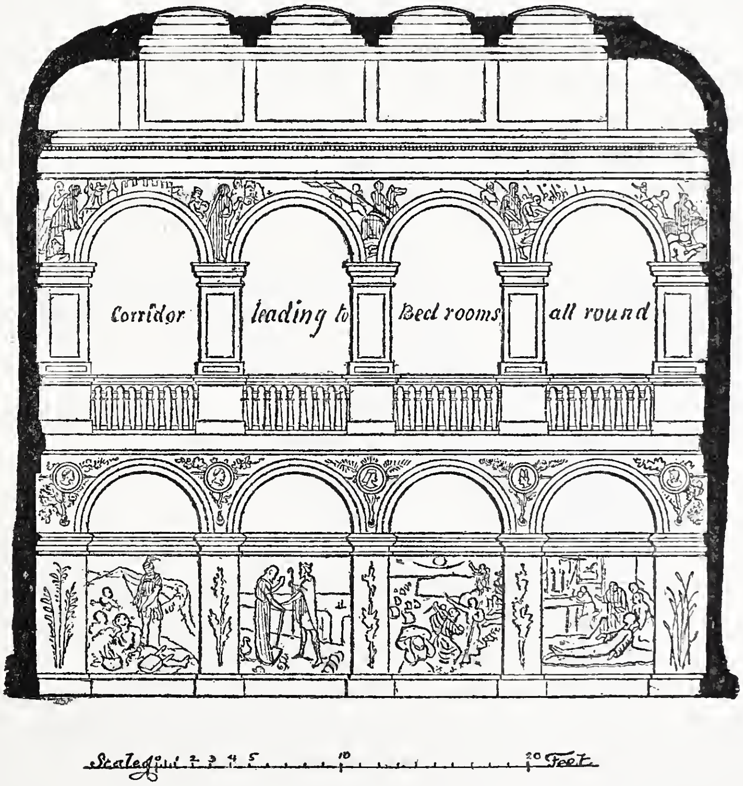
By W. B. Scott, Esq.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, December 2, 1867, Joseph Clarke, F.S.A., V.P., in the Chair.*

Under the impression that the members of this Institute are nearly as much interested in the application of painting to architecture, as in architecture itself, I submit for their inspection a series of pictures fitted for the spandrels of the gallery surrounding the central apartment or hall of Sir Walter Trevelyan's house at Wallington.

A few words may be necessary to describe the building and the particular wall the paintings are to decorate, as well as the paintings themselves.

The house, which has little external ornament, was built about one hundred and thirty years ago, at a time when a fashion prevailed of dispensing with lobby, hall or ante room, the principal entrance opening directly from the lawn or drive into the central and principal room of the house. In Northumberland there are other mansions besides that of Wallington, built on this plan. Nethter Witton, one of these, retains this arrangement, and the visitor is inducted directly into the dining room, that being the central room of the front. At Wallington the central room of the front is the drawing room, and the principal entrance still remains there, now only used occasionally. The plan of the house, which is very large, was a quadrangular mass of building, the inner wall (to the quadrangle) being pierced with windows lighting a corridor on the ground floor all round three sides, a similar corridor above also all round three sides, the fourth side giving light to the great staircase. The entrance being as already described, the great staircase was altogether apart from it, could, indeed, only be reached through the principal rooms of the house. Besides, the quadrangle enclosed by the high blank walls, was a damp inaccessible court. To change the plan and convert this


Corridor leading to Bed rooms all round
Scale of 1 2 3 4 5 10 20 Feet

Section through Corridors at Sir W. Trevelyan's Mansion, Wallington.

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* The name of the Chairman (D. Brandon, F.S.A., Vice-President) at the Ordinary General Meeting, on the 18th ult., was accidentally omitted in our last issue.

court into a saloon was intrusted to the late Mr. John Dobson, the able architect of Newcastle,* who attained his object by taking the entire inner wall on three sides down, and in its place making two arcades, the lower one of solid stone piers and arches, the upper supporting a ceiling of the form called, I believe, by an Italian phrase, *à schifo.* Besides being coved on four sides at the wall line, it is divided by the beams into square coffered panels, in the centre of each of which are large hemispherical glass lights, specially cast in one piece by Messrs. Swinburne. These being very thick and heavy have obviated entirely the constant trouble in a wet and windy climate, caused by top glazing of any description involving sashes and putty. They are globular, like watch glasses, slightly obscured in the making, and insure all the year round an equable shadowless light as long as day lasts, showing the decorations and pictures in an unexceptionable manner. Here for once the difficult problem of lighting picture galleries has been solved, whether applicable at a lower height and under other circumstances I cannot presume to say. The fourth wall, that protecting and partly supporting the great staircase (the south side) Mr. Dobson treated in a way to preserve the unity of the apartment; the lower part necessarily remaining intact, he faced it with solid stone pilasters and arches, and built up the arcade on the side opposite (the north side) to correspond. This was the more happily devised, inasmuch as that portion of the house was occupied by the kitchens, servants' hall, &c. Thus the saloon had, on the ground floor two sides, each shewing four panels or recesses, inclosed by stone pilasters and arches, admirably adapted for painting, and out of this grew the scheme of decoration, part of which is now submitted to your inspection—namely, eighteen illustrations from the old ballad of Chevy Chase, fitted for the angles and spandrels of the upper series of arches.

The house being a Border mansion, the decoration, which was put into my hands as a pictorial rather than ornamental undertaking, was treated with reference to Border history. The eight panels were fitted with a series of pictures, the subjects of which began with the Roman Wall, which ancient fortified barrier passes not far off, and ends with the Industry of the Tyne—four ancient and four modern incidents in history:

1. The Building of the Roman Wall.
2. King Egfrid offering the Bishopric of Hexham to Cuthbert, hermit on Farne Island.
3. A Descent of the Danes on the Coast.
4. Death of the Venerable Bede.

And on the opposite side, the later subjects—

5. The Spur in the Dish—the sign to the Mosstrooper that the larder was empty.
6. Bernard Gilpin taking down the gage of battle in Rothbury Church.
7. Grace Darling and her Father saving the shipwrecked Crew.
8. "Iron and Coal"—the industry of the Tyne.

To complete this comprehensive scheme, Mr. Woolner was engaged to work out a group that would embody or at least indicate the result of the whole, and he has done so by the production of his best work, exhibited for a month in the beginning of the year at the South Kensington Museum, and now being placed on its fixed pedestal in the centre of the saloon.

The stone pilasters dividing these pictures, and the solid piers corresponding to them on the two arcaded sides, are partially decorated. The stone is of a very light-coloured close texture, very agreeable in tone, and the experiment of painting foliage in ordinary oil paint without any preparation or

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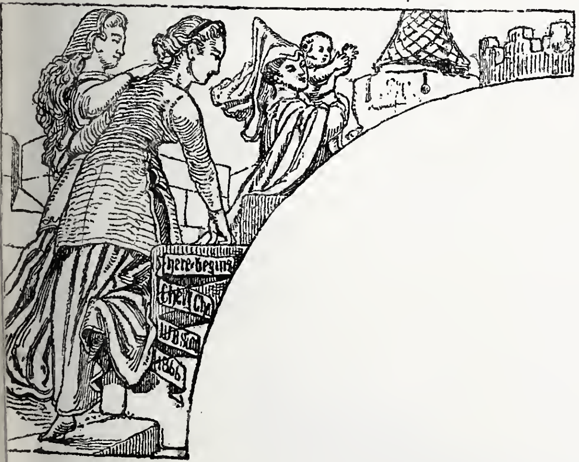
* Perhaps I may be allowed to remind the members of the Institute that Mr. Dobson was the architect of the Central Railway Station in Newcastle. He began a practice of sixty years before pointed architecture was considered anything but barbarous, and was happy enough to terminate his career, by the completion of this great Italian station. after the united railways had ignored for ten years the best feature in his façade.

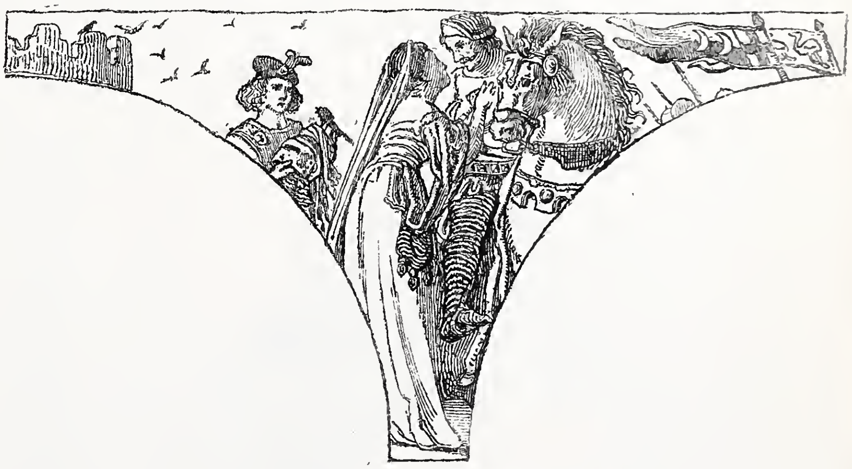
"grounding" whatever has been completely successful. Such grounding, would, of course, hide and lose the surface of the stone, which it is so desirable to retain in its natural state, and there is no difficulty in doing so. There is, indeed, a little difficulty in getting the paint, laid on with an artist's small sable brush, to overcome the grit and shew a uniform surface, but the difficulty is only one involving a little more time, and it may be safely affirmed such painting is unchangeable, and as to its duration, will assist in preserving the stone itself. In the spandrels above, surmounting these pedestals, the surface being plaster, and the decoration to be done by degrees by various hands, the painting was executed on prepared linen cloth, which was cut exactly to fit the shape of the spandrel, and applied by a mixture of glue and paste, the plaster being previously well saturated with oil and paint.

It will be unnecessary to describe this work further, than to explain by a few words the nature of the pictures now exhibited. They are for the upper series of spandrels—those over the piers and arches of the corridor leading all round to the bed rooms. They are on prepared linen to be applied as already described The subject is the old Border ballad of Chevy Chase, and is divided into four parts, each part to occupy a side of the apartment.

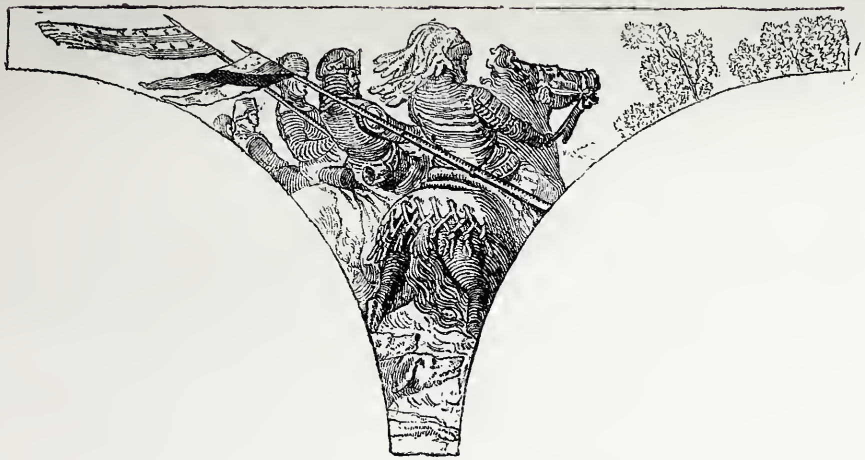
It is the history of a day and a night, from sunrise to sunrise, the angle at which the last picture joins the first happily coinciding with the period of the morning and the aspect of the sky in both. I may also remark that this period of twenty-four hours affords the greatest variety of aspect—morning, noon, evening, moonlight, and dawn.



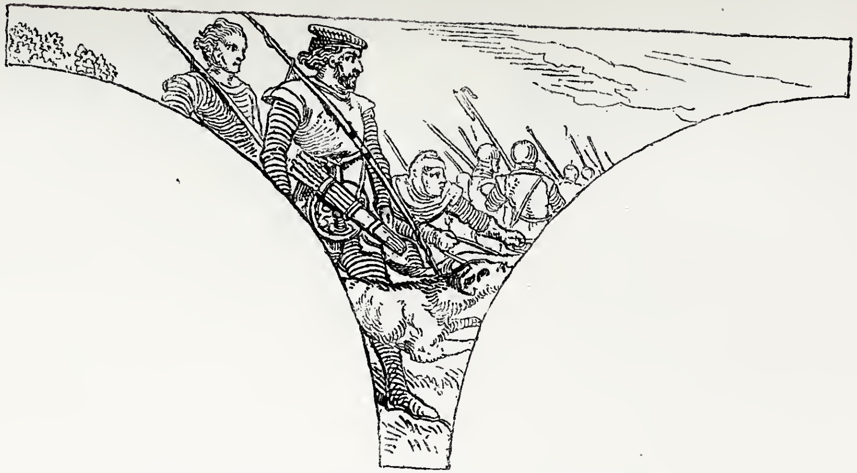
No. 1. BEGINNING OF SERIES.
THE DEPARTURE, seen from the Battlements.



No. 2. Earl Percy parting from his Wife.

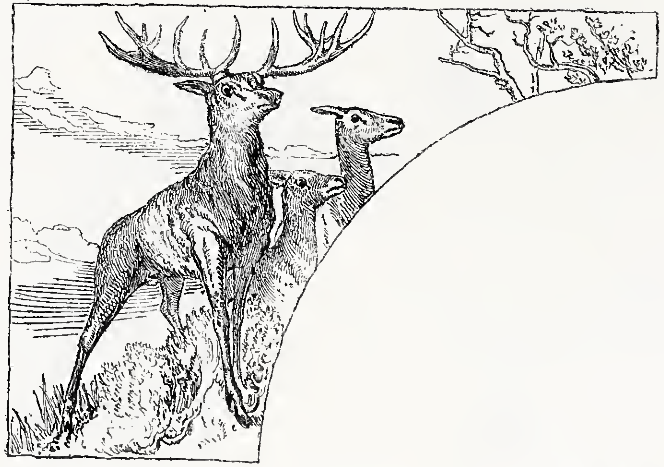


No. 3. The Knights Retainers trotting away—Heron, Lovell, Withering, &c.

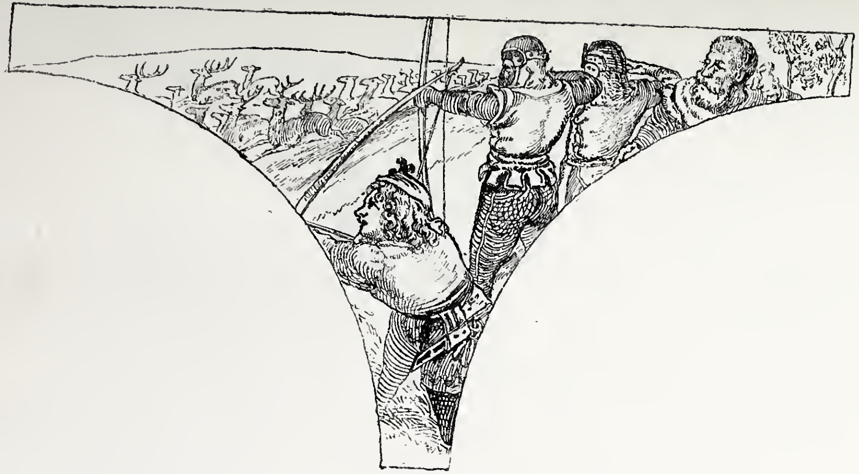


No. 4. The Footmen and Bowmen ; Dogs in leash.

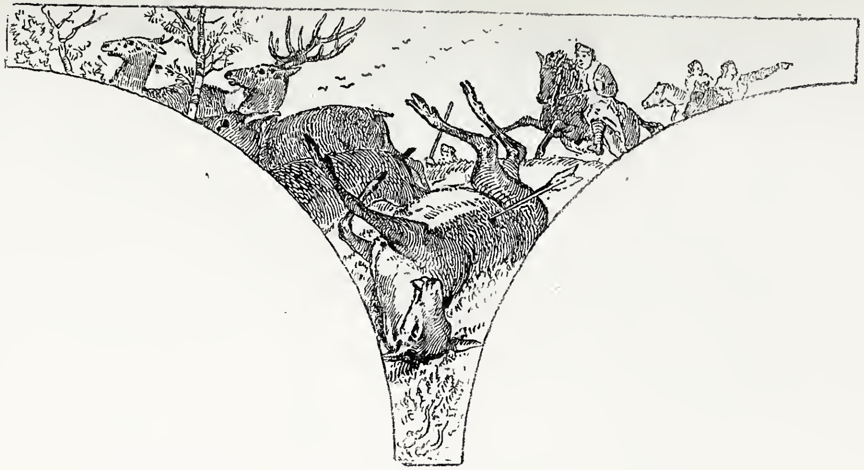
No. 5. The Sight of the Deer—watching from a distance.



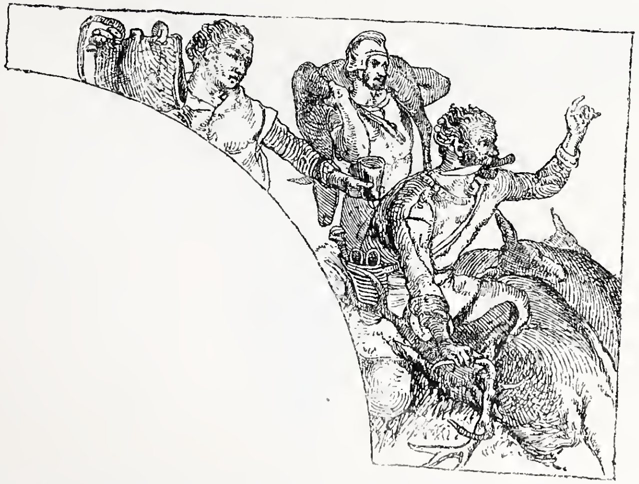
No. 6. **THE HUNTING.** The Leader of the Herd: a Stag of ten.



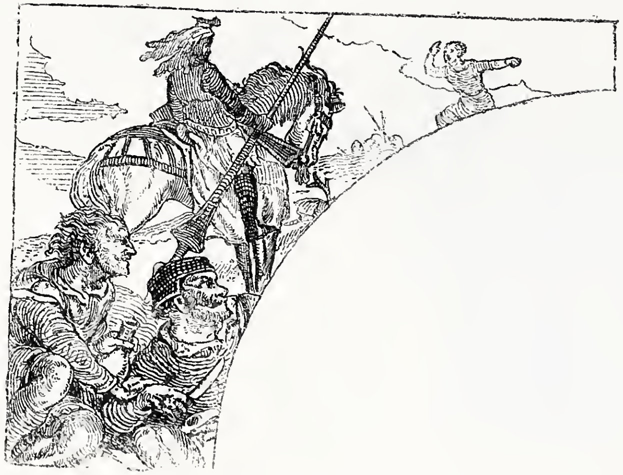
No. 7. The Battue—the Archers posted for shooting.



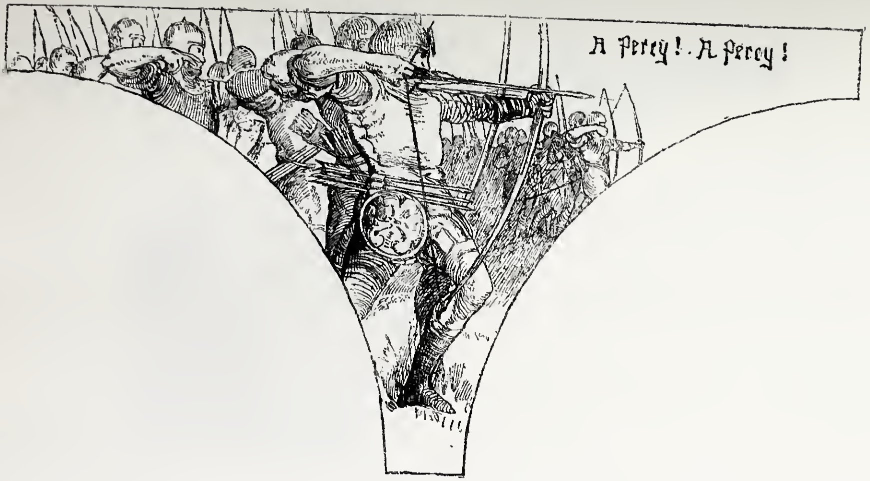
No. 8. The Rear of the Herd, drivers following.



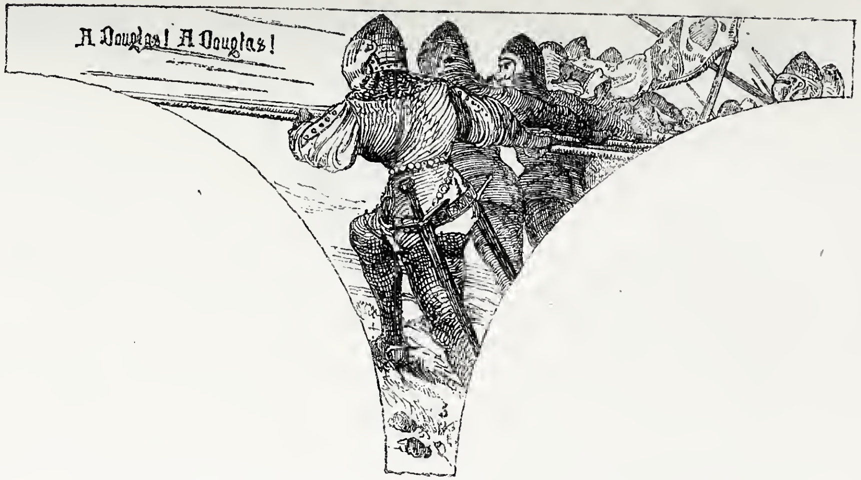
No. 9. The "brattling of the Deer"—cutting up the dead animals



No. 10 THE BATTLE. The Chief waiting—tidings are brought of the approach of the Scots.

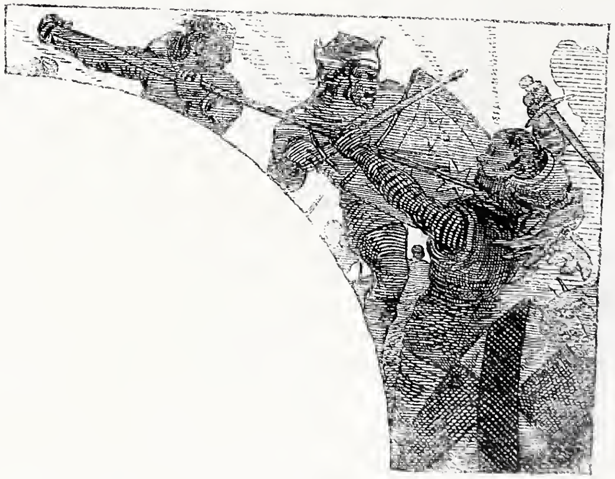

A Percy! A Percy!

No. 11. The English Bowmen advance;—a Percy! a Percy!


A Douglas! A Douglas!

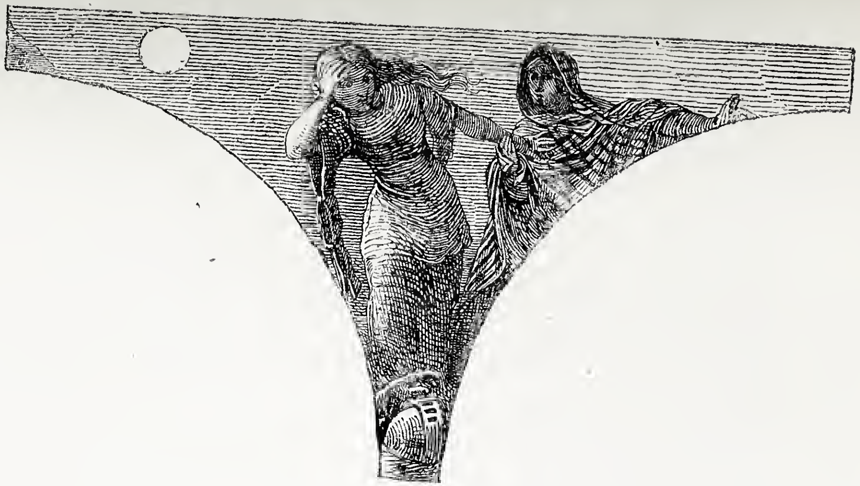
No. 12. The Scottish Spearmen closing in;—a Douglas! a Douglas!

No. 13. The Douglas dies by an arrow: the Percy by the spear.

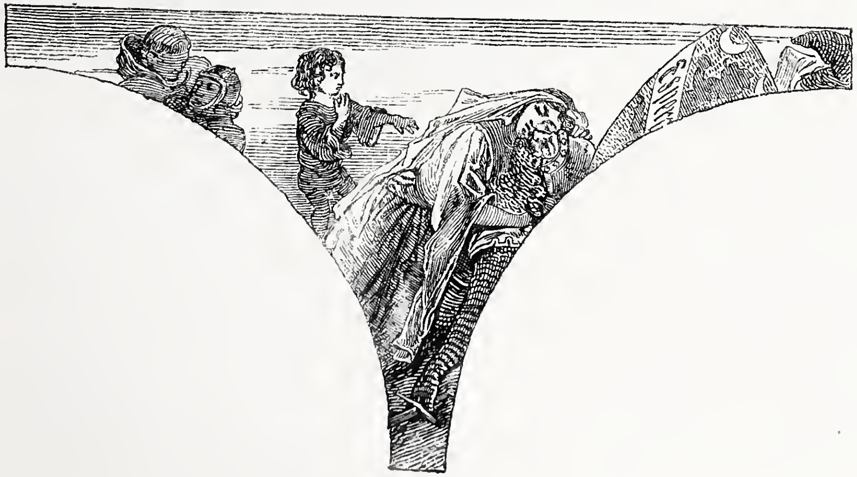


No. 14. The Death of the Witherington: end of the battle.

No. 15. NEXT NIGHT AND MORNING. A Leech extracting an arrow.



No. 16 Women looking out for their Husbands and Brothers.



No. 17. The Percy's Body found by his Wife.

No. 18. The Return to Alnwick with the Dead.

Mr. JOHN P. SEDDON, Hon. Sec., said—The decoration of architecture by painters of eminence, such as Mr. Scott, was unfortunately a rare occurrence in these days. Members would therefore gratefully hail this series, in which the subject was most poetically conceived, and the difficulty of adapting the designs to the forms of the spandrils was very happily overcome.

Professor DONALDSON, Hon. Sec., For. Corr.—All must be aware that the Border regions are particularly rich in the minstrelsy of those parts which describe the forays and attacks, both of Scotch and English passing each other's borders, and the meetings of large bands of brave warriors nourishing the deepest hatred to each other, and the desire to avenge previous unsuccessful incursions. Therefore the mixing up of such illustrations of history is peculiarly interesting to buildings in that part of the country. I recollect when I had the honour of visiting Alnwick Castle with the Duke of Northumberland, in company with the Cavaliere Canina, Mr. Salvin, and the late Professor Cockerell, we were debating together on this subject of pictorial decoration, and his Grace subsequently directed a series of paintings to be executed for the decoration of the walls of that castle; and the result has been a pictorial illustration of a succession of very remarkable historical incidents. It occurs to me that the mural paintings as we find them in Italy are particularly well suited to this style of decoration, and copies of some of those great pictures have been produced in a very admirable manner in Stafford House. It shows how painting allies itself to architecture, and gives a deep interest to all the styles described. It is the more happy when it records the history of the country in which such buildings are situated. There is one question which arises in my mind as to the mode in which this work has been carried out. It appears that there is a kind of canvas or cloth—[Mr. SCOTT—These are the pictures that are to be put up.] At Mr. Hope's house in Piccadilly, which I built, we had canvas glued on to the plaster of the wall, of a very rough texture indeed,—so rough, in fact, that you could see the grain through the ornamentation. This ornamentation was painted on a ground of gold, of light diaper pattern. The effect of the texture of the canvas and the gold is an extremely rich surface. It was mentioned in the Paper that the texture of rough canvas would not look well, but in this case it does; and the same thing is carried out very much in France, and in other places in England it has been adopted. There is much practical experience yet to be learnt in the mural decoration of buildings: first, in the mode in which it is to be carried out, and next in the selection of historical and interesting incidents for illustration, as has been done on the walls of Sir Walter Trevelyan's house.

Sir CHARLES TREVELYAN, K.C.B., Visitor, said—I much regret that Sir Walter is not here this evening to return his acknowledgments for the kind manner in which Mr. Scott's work has been received by this meeting, and also to testify to his obligations to Mr. Scott himself. In his absence I will offer one or two remarks. It appears to me that this house at Wallington affords a good illustration of the progress of our domestic architecture. The germ of the building was an ancient tower, which was sold with the estate by Sir John Fenwick a few years before he was beheaded in William the Third's reign. It was purchased by the Blackett family, of Newcastle, by whom the house was built. It is a perfect square, and there were no connecting passages; but the entrance was in the principal room, which served as a hall, and the communication through the house was from room to room; and there was a large square court in the centre. The old tower I have alluded to was built into the wall, and the lower portions of the tower form the cellars of the modern house. The first improvement which was made in Sir William Blackett's house was that a passage was made round the inside of the court in two storeys, into which the doors of the rooms opened. That remained till the time of the present owner, leaving the inner court not so large as it was by the passage which was taken out of it. This inner court, which was open to the sky, was not suited to a part of the country where the climate is more inclement than it is here, and the snow and rain which were admitted into the centre court made the whole house damp and uncomfortable. Sir Walter Trevelyan then conceived the idea of availing himself of the modern constructions in iron and glass, and threw a roof over this inner court, converting it into a central hall, and the passages connecting the rooms in the upper and lower storeys were opened into it in the form of arcades. Then he proceeded to the decoration of this central hall. I will not attempt to describe the details of that decoration. I regret that the principal works of Mr. Scott, which have been alluded to, are not here; but I may say that they are interesting and characteristic, like those now before you, and that they are more highly finished as works of art. I may state generally that the three sister arts of architecture, sculpture, and painting all contribute to the decoration of this room; and, although on a small scale and in a humble way, they stand here in the relation in which they ought to stand to each other. In the centre is the group by Woolner, representing a Christian mother teaching her child to pray, as the highest type of modern civilisation. The pictures by Scott commence with the building of the Roman wall, and end with the High Level Bridge at Newcastle. The wild flowers of Northumberland have been painted on the pilasters by many an affectionate and friendly hand, and the whole will be connected by the stirring and affecting incidents of the Hunting of Chevy Chase round the spandrils of the arches.

Mr. G. E. STREET, Fellow.—I wish, after what has been said about the architectural interest of this house, to express my own feeling—and I am sure it will be the feeling of all present—on this subject. The architect owes an immense debt of gratitude to the painter who will undertake to paint anything to decorate a wall. If there is one difficulty more than another which stares us in the face it is that of persuading a painter to look upon such work as this as anything but a picture to be hung on a wall, and not to assist in effect the architecture of the place which is best seen when adorned in this way. We therefore owe immense thanks to Mr. Scott for what he has done. I have seen some of the sketches for the lower portion of the wall, but we see here remarkably well, considering the circumstances, what is to be put upon the walls there. If this experiment answers, and if the effect of the light is such as enables you to see these oil paintings without glare and as satisfactorily as distemper on the face of the wall, it will solve one of the great difficulties which one has now to encounter in getting an artist like Mr. Scott to do work in out-of-the-way places. Very few painters like to leave London to do their work. If Mr. Scott can execute this work here; if it is not damaged by damp; if it is to be well seen, and the effect of the colour is *flat* enough to be seen, it will be an enormous advantage to have the chance of seeing some of these buildings decorated in a way which, without such assistance as Mr. Scott has given, we are hopeless of seeing. Feeling this, I venture to propose the best thanks of the Institute to Mr. Scott, not only for the short paper he has given us, but for having—not absolutely set an example to painters, because there are some wall paintings already—but for having done that which few painters of eminence will be found ready to do, viz., taken the trouble to elaborate a very charming subject for such decoration, which in his hands is from beginning to end harmonious, full of interest, and of poetical feeling.

Mr. BURGES, Fellow.—May I ask whether these pictures are of the full size? [Mr. SEDDON replied in the affirmative]. Then, in the first place, I am glad to see them here, and in the second place, to hear that they are intended to be reproduced in the published transactions of the Institute. I agree with my friend, Mr. Street, that it is of importance to get painters of eminence to decorate walls, but I must say I think these are treated too much like oil pictures. I think they would have been better done in distemper or fresco, and in much brighter colours. It also appears to me that a more uniform tone is required. If we are to have the assistance of artists like Mr. Scott decorating the walls of houses or churches, I would only express a hope that we shall have less of the Venetian School and more of the Tuscan than we have had hitherto.

Mr. M. Digby Wyatt, Fellow.—One word on the point just alluded to with respect to uniformity of colour in any series of pictorial subjects, combined with the different architectonic parts of any apartment decorated throughout in polychromy. I think the last speaker should have made the following distinction,—the necessity, or the contrary, for any such uniformity is, I believe, dependent on the relative importance and extents of the surfaces decorated respectively pictorially, or in conventional colour only, provided in any apartment you cause the leading portion of all the surfaces to be decorated in strong colours, repeating themselves with simple regularity, the eye will be satisfied whether such dominant portions assume the form of pictures or of architectural parts only. If you have obtained, any how, your symmetry in the major, you may dispense with it in the minor. Hence it is obvious that in cases where the main polychromatic effect is dependent upon the colouring of a series of paintings (as for instance in the "Stanze" of the Vatican, or the Scuola di San Rocco, at Venice). There, I agree, you must have uniformity in the scale of convention of any such series; but in cases where the pictures are secondary, and the architecture primary (as for instance in the Galerie d'Apollon, of the Louvre, or in the Loggie of the Vatican), the painter may be left to vary his style of chiaroscuro colour and handling at his own good pleasure. Thus it becomes the duty of the decorative artist to study all the conditions of the building he has to decorate. Where he sees its leading architectural parts are thoroughly good he should keep his work down, where they appear unsatisfactory he must put out all his strength to win the eye for his own department. If the architectural parts are good, but monotonous, he must run into and break them up; if, on the other hand, they are but "disjecta membra," he must tie them together and harmonize them with his decoration. I believe these to be the correct principles on which decorators should act in such matters: it is that which was adopted by Raffaelle, Giotto, Luini, and Pinturicchio, who were perhaps the most harmonious mural painters whose works remain to us. With regard to applying canvas to wall and ceiling surfaces, I would warn artists who have it to do not to employ glue nor paste. The best mode of attachment is to paint the surface to which you have to make the canvas adhere well with white lead and oil, getting a good body on it, and while still tolerably green put on a thick coat of white lead with a little gold size, which makes it set very hard, then paint the back of the canvas with white lead and gold size, and rub it well down, so as to cause it to adhere evenly; the fibrous texture of the canvas causes the fresh white lead to adhere well to the canvas, and the green white lead adheres well to the white lead applied to the wall or ceiling surface shortly before pressing the canvas up in its place. The sticking medium being mixed with oil, damp has little effect upon it. If glue or paste are used the canvas will expand and contract according to the condition of the atmosphere, the paste or glue being affected hygrometrically as well as the fibre of the canvas, and in time will detach itself. When Mr. Alfred Stephens was so good as to paint for me a reproduction of Raffaelle's ceiling of the Camera di Segnatura, for the Italian Court of the Crystal Palace, and Mr. Smallfield one of Perugino's ceiling of the Saladi Cambio, at Perugia, both were done upon separate pieces of canvas and put up in the way I have described. At the present time neither have become detached in the slightest degree. This being a practical matter, I take the present opportunity of mentioning it. I would also call the attention of architects and artists who desire to use oil paint in this way, to a very excellent material prepared bv M. Binaut, of the Rue de Clery at Paris. He makes canvasses larger than 20 by 20 feet in a single piece, on which the whole of a ceiling can be painted in the studio for subsequent application elsewhere. He sells it ready prepared for the painter's use, grounded in any graduated tints which may be required. It is a very handy material, and is light and of a nice surface. One word as to the peculiarity of the texture of canvas used for decorative purposes. The reason only rough canvas has so good an effect for mural paintings in oil, is because it is in fact the only means by which the usual glitter of oil painting can be overcome, excepting of course by such an alteration of the vehicle by the admixture of turpentine, wax or gum damma, as scarcely leaves the picture what is usually called an oil painting. If canvas, fine in texture, evenly grounded with a non-absorbent ground, smoothly pumiced down, be painted with colours ground in oil, and with nut or linseed oil as a medium, the surface of the picture will be so flat, that when it reflects light it will reflect it as from a luminous sheet. With canvas in large granulation painted even with the same vehicle, light will be reflected from every minute elevation of the canvas in tiny scentillæ or pencils, but the corresponding depressions will be all in deep colour—*i. e.* colour either in shade or in shadow. That is why oil paint applied upon a coarse canvas produces a better effect for mural decoration than it does when applied to a perfectly flat surface of fine canvas. The old Venetian paintings were usually executed upon canvas, the texture of which is quite obliterated by the heavy grounding, and much varnish has been used in the finishing; the consequence is that they glitter most disagreeably. The preparation used habitually by French and German historical painters, produces a dead or "mat" effect, partly by the nature of the preparation, usually a bastard-encaustic, and partly by the coarse granulation of the canvas upon which it is applied.

Mr. W. B. SCOTT rose and said, It is gratifying to hear the various expressions of opinion from those present; but the matter of fresco and distemper painting in comparison with oil painting is a question much too large to enter upon here. It has been very much discussed in other places, and has been constantly discussed for a number of years in connection with the Houses of Parliament; and I think the advantage of fresco is pretty much given up. I fancy we shall never take to fresco again in this country, unless it be on very carefully prepared interior walls, and after an apprenticeship on the part of the painter it might be tried with success. But I look upon it that the silica process has superseded it, and apart from that, the introduction of oil pictures; canvas pictures, planted on walls is almost the only chance of getting interior decorations well carried out. The danger and difficulty of getting the walls painted without having the works done in the studio, and applied to the walls, are so great that, as Mr. Street says, we are rather chary of it. Then the only difficulty, as it appears to me, in using canvas pictures is in the matter of lighting. If they have no shine, the whole advantage of the canvas picture and oil painting is obtained. Oil painting stands the climate of England better than any other kind of painting, and if it has no shine it appears to me the best adapted to this description of decoration. Since writing this little paper I have been thinking about the mode of lighting the Hall at Wallington. It is a very perfect method of lighting pictures, as far as we have seen, the light being admitted over the whole ceiling from twelve convex plates of ground glass, and, as far as we have tried it, I think it is perfectly successful. [Mr. SEDDON,—You do not find any shine?] We have found no shine on any part of the wall. [Professor DONALDSON,—Are the convex plates ground glass?] They are cast in rough moulds, which comes very nearly to the same. I may add that I have been doing some work in Ayrshire, which is in tempera. It is done with a mixture of wax and turpentine, so that I am not entirely wedded to oil painting on canvas.

The best thanks of the Meeting were then passed to Mr. W. B. SCOTT for his interesting Paper.

Royal Institute of British Architects.

9, Conduit Street, Hanover Square.
W.

16 Dec 1867

Dr Sir

33, Elgin Road, Notting Hill,

Please send Mr W. B Scott one copy of his paper at once & 12 Do after revision.

Also one copy of my paper at once to Mr Cundall & 12 copies after revision (instead of some) The above & the rest required for J B K after Revision & with greater care in printing the cuts —

Mr Davy. also to the Arts Club after revision

Keep both papers in type until ordered otherwise

faithfully yours
J. P. Seddon

All the blocks belonging to my paper to be sent back to Mr Cundall when done with –

Mr Scott's to await further orders –

Capt. Seddon, R.E.
5 Medway Villas,
New Brompton,
Chatham

ON THE PHOTOGRAPHS TAKEN FOR THE ARCHITECTURAL PHOTOGRAPHIC SOCIETY IN THE YEAR 1867.

By **John P. Seddon**, Hon. Sec.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, December 2nd, 1867.

Joseph Clarke, F.S.A., Vice-President in the Chair.

I have ventured to bring before the notice of this Institute the photographs which form the issue of the Architectural Photographic Society for the present year, for two reasons. Firstly, because the responsibility of the selection of the subjects fell upon me, causing me to be, perhaps, the fittest person to give any explanation with respect to the choice; added to which, having so recently visited them, I may be able to furnish some information with regard to the buildings from which they have been taken. And secondly, being the only architect who has yet accompanied the photographers of the Society during any of their tours, I can speak from experience as to the task they have to perform, and the difficulties they have to encounter.

Previously all that the Committee have been able to do has been to suggest the route to be taken, and to give a list of the objects of which they desired to obtain photographs. A large latitude has then necessarily been left to the photographers, who have had to take a sufficient number of negatives to allow the Committee some choice.

It is obvious that by this means there must be great difficulty in communicating the special wants for which the Society was formed, and an almost undue amount of responsibility thrown upon the unassisted operators, who are not themselves members of the architectural profession. Furnished with only a skeleton of the route they are desired to take, they have on previous occasions constantly found themselves misled by reports as to buildings, which they have gone a long way out of their road to see, only to find them worthless for the purposes of the Society, however elaborate or locally renowned. Again, it has often happened that really valuable works have proved out of the reach of their art to represent, by reason of their position or surroundings. Such an instance occurred once in the case of the interesting Romanesque church at Thun, in Normandy, from its being completely enveloped in foliage, as an owl in an ivy-bush.

Such difficulties and *contre-temps* not only entail a certain amount of disappointment on the subscribers, whose views are thus prevented from being met with exactness, but the expenses of the undertaking are so enhanced, that the result, in the shape of the number of photographs in the year's issue, is diminished. Another cause which operates to the same effect, is the necessity under which the photographers feel themselves to take more than the required number of negatives, in order to give the Committee the power of selection, in consequence of its not being possible to furnish them with precise instructions. The negatives set aside cost as much as those chosen, and though practically wasted, must of course be taken into account.

Having occasion myself during the spring of this year to visit the borders of the Rhine, and finding that I should have to repeat my visit, it occurred to me that I could, without any great sacrifice of time, if that district should be selected for the operations of the year, pioneer the ground, and point out such objects as should, in my opinion, be suitable ones. This proposition was submitted by me to the photographers, and by them to the Committee, and ultimately was accepted, although not without misgivings, as the following extracts from a pithy letter on the subject from the Honorary Secretary of the Society will serve to show, as it does also his vigilance and anxiety as to the result of its labours.

" The proposal of giving a lot of German photographs filled me with dismay. The little I have seen of German work gave me the idea of mouse-traps or bird-cages done in stone, wonderful in point of construction as most mediæval buildings are, but even further removed from art than most mediæval work." . . . " I consider that as we call ourselves an Architectural Association we should do what we can rather to improve the taste of our architects, and show what is good to the public, than to merely publish a sort of architectural crib for daily use. If we are ever to have any architectural art, Gothic must of necessity be but a transition; our method of construction is entirely different, our habits, thoughts, and tastes are diametrically opposed to those that prevailed in the Middle Ages, and the present fashion is no more likely to last than the French enthusiasm about eating horseflesh, when we can get good beef and mutton. The public are very slightly tinctured with any feeling for beauty, but the enthusiasm and energy with which the Middle-Age revival has been pushed has given them a sort of interest in odd shapes, intricate patterns, and mechanical invention displayed in this revived work, just such an interest as a child takes in one of the carved ivory Chinese balls; but as the people get educated they will naturally ask for works of art, and that art must be suitable to the construction practised, and to the refinement of taste which exists in our general life,—composition, elegance, and simplicity rather than complexity, huddling, want of taste and proportion in mediæval work; and if the architects are solely instructed by that style, their minds will get a sort of ply which will make them admire oddness and distortion, and prevent them from appreciating anything that is really elegant, beautiful, or artistic. So I suggest as a compromise that we give the mediæval men the best examples we can meet with to improve them in their own style, as far as that can go, but not to deprive them of the opportunity of seeing things that in point of art are as superior as a statue of Phidias is to an image of a cannibal islander; and I suggest that we give them next year some of the Renaissance tombs from Venice, Florence, and Assisi, and that we also give good examples from the best Eastern work, from which all the good in mediæval art came; and my own impression of German Gothic is that it is the very bathos of everything bad; worse even than English Gothic, which is saying a good deal. I don't expect you to agree to all I have said, but I am quite certain about its truth, and have no more doubt that it will be admitted hereafter than I have that three angles of a triangle are equal to two right angles; and I am also sure that if a race of architects does not spring up who can not only feel this, but are able to apply it, architecture will sink not only lower than it is now, but will be like heraldry or astrology put aside by the mass of the people, and be only used to gratify some crochet for a burlesque of some former style of art, whether Gothic or Greek."

The receipt of the above fairly took away my breath, and made me feel very like a culprit, for, although it is true that I could not agree with many of the opinions thus advanced, I could not but allow that there was a great amount of truth in what was urged. The exigencies of *practice*, however, will not always accord with *theory*, and the only suggestions made for immediate action were quite out of the question on the score of expense. Thus I doubt not that the enterprising photographers would not have hesitated from selecting Italy as the scene of their operations, despite wars and rumours of wars, and might even have applied for a *corps de garde* of Garibaldians, had it been deemed desirable to invade the Papal dominions with their portentous instrument: and our friend Mr. Ferguson could, I know, have given them information of some lovely Eastern monuments scattered amid the jungles of India, where Gothic details in their very swaddling-clothes are wasting their sweetness on the desert-air. One small impediment alone presented itself to demolish these views, which I fear must remain for the present but agreeable castles in the air,—namely, the cost far exceeding the means of the Society, which is unfortunately of a strictly *limited* character.

The field I had proposed might be a much less profitable one than many others, but the architectural world is not so vast but that, if the Society's existence be as stable as I hope, it must sooner or later be chosen. Far abler guidance than mine, I well know, might be found, but none other presented itself, and my direction was so fixed by stern circumstances that I could neither brave the bandits of the Abruzzi nor the tigers or Thugs of Bengal, had I been so inclined.

Coblenz then was fixed as the head-quarters of the expedition—the pivot round which it was to revolve. Thence, before the arrival of the photographers, I rapidly scoured the neighbourhood, visiting most of the places on the banks of the Rhine from Cologne to Bingen, of the Lahn as far as Limburg, and of the Moselle as far as Münster-Maifeld; and so was able to arrange the subsequent excursions with the least possible loss of time or chance of waste journeys. Notwithstanding this, however, the actual operations proved more difficult than I had imagined possible. The bulk and weight of the *materiel* to be carried about was great, and the time necessarily consumed in unpacking, setting up tents, and repacking, hampered our powers of locomotion, and the conditions of the light and atmosphere proved terrible tyrants. Sometimes we came upon a noble structure, full of interesting detail, but found the only available point of view was from the eastern side, and that the light had already left it, so that nothing could be done till the earth had again nearly revolved upon its axis. Or, when this fact had been known and provided for, it so happened that the sun altogether declined to make his appearance upon that special occasion. Indeed, the state of the weather was no longer to us merely the moral to adorn a tale, but a matter of continual grave consideration; but the fickle jade played us sad pranks. We worked hard for five weeks without losing a day, starting early and returning late, during almost all which time we were plagued with persistent bad weather; day after day, week after week, we continued, hoping against hope, that it could not go on thus for ever; yet such it did until the last three days, which fortunately were those we had to spend at Trèves. One special journey made to Neuss was rendered fruitless by a fog as thick as one of London in November. Another to Swartz-Rheindorf by a similar atmosphere, enlivened by the accompaniment of a hurricane. At Limburg we stayed two days, struggling to make use of an occasional gleam through the rents in thunder-clouds which swept over the sky all the time. At Andernach the camera was capsized by a storm that only ceased after we had left; and at Schloss Elz, a drive of sixty miles produced but one negative, which escaped as by a miracle, having been blown down with the tent by a whirlwind that had previously hurled the same unlucky camera over a precipice.

But enough of these troubles, which I have only mentioned in order to do what I conceive to be but justice to the photographers, the result of whose labours would, I feel sure, be viewed with additional leniency when it is known what difficulties have to be encountered, and how great is the energy and zeal with which they are surmounted; for I can testify that no pains or cost is spared on the part of Messrs. Cundall and Fleming to obtain the most satisfactory results possible under the circumstances. These results in the present case may be divided into subjects taken from ecclesiastical and secular works, and again subdivided into general views and details.

Of ecclesiastical buildings—

Laach Abbey furnishes 1 general view and 1 detail.
Andernach Church . . . . 3 details.
Boppard Church . 1 general view.
Heisterbach Abbey . 1 general view.
Sayn Church . . a View, including an interesting fountain; and
Trèves Cathedral and Church of Notre Dame, 2 general views, with 4 details.

Of secular buildings—

Trèves furnishes one view of the Porta Nigra.
Schloss Elz—a fine example of an old baronial residence.
Boppard—an ancient house of timber construction.
Rhense—an ancient house of timber construction.

From this list it will be seen that the obnoxious German Gothic does not figure largely among the photographs. Indeed, I have myself a very similar feeling to that expressed by my friend Mr. Aitchison on that subject; but of the Romanesque and Transition works of the Rhenish provinces I have a very high respect. I have elsewhere dwelt more fully upon them. At Trèves, however, the exquisite Gothic Church of Notre Dame would I think induce even him to speak a little less severely about the want of refinement of the art of the Middle Ages, and I for one should only be too glad to see modern architecture at all approach to the consummate delicacy of detail and rythmical proportion of that charming monument, which perhaps, however, can hardly be claimed altogether as German Gothic, as it has evidently much more in relation with the cotemporary works of that style in France.

Taking the photographs in the order in which they appear in the list issued by the Society, we come first to that of

SCHLOSS ELZ.

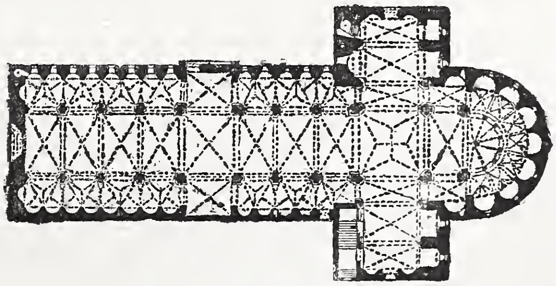
In visiting the relics of bye-gone ages, it generally requires a considerable effort of the imagination to realize in idea the times which gave them birth. Their forlorn condition as ruins, and their evident contrast with all the work of more recent periods, puts them so completely out of harmony with the present, that they, rather than the spectator, seem strange in comparison with the surroundings. The ivy-clasped fragments of walls which crest so many of the heights which overhang the banks of the rivers on the Continent, seem to hold their title of castle by courtesy alone; for as possible residences they now look to be as absolute myths, as the legends which are still told in connection with them. But the visitor to Schloss Elz is struck by quite another impression. It is himself that in this secluded valley seems to be out of his proper element; no other building than this picturesque old mansion has he seen for miles as he drove along to it; and here it appears so much at home, rising boldly, intact, though dilapidated, from its rocky eminence in the centre of the winding ravine, that the modern traveller feels as if it were more than probable that his advent has been watched by some of the clan of the robber-baron who of old made it his lair, and that he may be presently pounced down upon, and black mail levied from him at the least, if he escape from forcible detention in some of the gloomy dungeons of which it has sufficient store.

And many have been the hard knocks given and taken by the Lords of Elz, ere it became safe as now to wander at one's own sweet will in the lovely neighbourhood of their schloss. This, the crumbling walls of the Castle of Trutz Elz on an opposite crag remain to testify, for even the mighty Archbishop of Trèves—Prince and Elector of the Empire—found it more than he could do to compel these turbulent nobles to become his vassals or to check their disturbances, until he erected that fortress for the purpose of commanding theirs and to overawe themselves. His structure, however, has been the first to fall into ruin, and his secular power has vanished, whereas the Counts of Elz are still of position and influence in the country, and having moved with the times, need now no such unpleasant guard over them as security that they will keep the peace.

To obtain a favourable point of view whence to photograph the Schloss is no easy matter, and even to sketch it, as artists find, is difficult enough. The view which forms one of the present series was selected as giving the best idea of the amazing height of the building and depth of the ravine below. The main building of the principal front is seen in it to consist of a lofty rectangular mass pierced where required by mullioned and transomed windows of two lights, and with two picturesque corbelled Gothic oriels, the one with the pointed arched and traceried window belonging to the chapel, and the other to the principal saloon, both of which and some others are vaulted apartments. But the features which give the character to this pile are the corbelled angle turrets and cornices with the steep roofs, chimnies and tourelles; the last being constructed with timber framing, unfortunately have become so decayed, that they have lately been covered with slating to the great injury of the general effect. It is easy to see that a fire, and subsequent depredations by peasants of its few stone dressings, would reduce this castle to the same featureless condition as that of the blackened ruins which the voyager on the rivers passes so frequently. This example, which has more fortunately escaped the common fate of most of its class, is therefore of great interest, as showing what all of those must once have been.

The Abbey of Heisterbach.

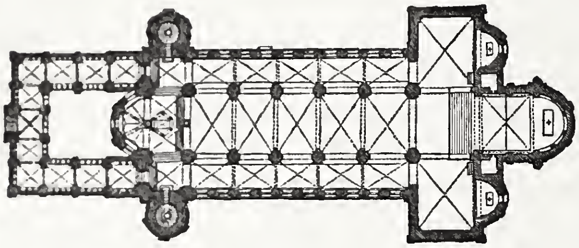
The ruined apse of the once famous Abbey Church of Heisterbach is situated in a lovely glen among the hills of the Siebengebirge, nearly opposite Bonn. The remainder of the building was destroyed early in the present century, and the materials used in public works. This, its only remaining fragment, is tolerably perfect in itself, and lacks only the wooden roof which once protected the vaulting, and the glazing of its windows. It is of the transitional style, and semicircular in plan, consisting of two stages, each having an arcade of seven small arches resting on slender shafts. The lower range rests upon a dwarf enclosure wall capped by a good moulding, at a height just sufficient to admit under it a trefoiled arched-headed doorway of communication with the aisle. The lower arcade has square unmoulded edges, and coupled columns, taking the inner and outer faces, there being transverse arches between these. The shafts are of limestone with square abaci and raised capitals of early transitional type. The bases of the outer columns are considerably stilted, even more than necessary to ensure their being seen from the church together with the inner ones. The arcade above has highly stilted semicircular arches over the inner range of those below, with somewhat slenderer shafts, having plain moulded capitals and bases with high square plinths, resting on the bold moulded string course which divides the two stages; the outer wall, pierced with a semicircular headed window in each bay, rests over the outer range of shafts of the lower storey, leaving a central narrow passage. The vaulting is curious and interesting, it springs from the capitals of the same upper range of columns, with merely a fillet edge in place of ribs, and each cell is concave, and its curve is adapted with great skill to the stilted semicircular arch which rises high into it. A narrow aisle runs all round the apse, and in the thickness of its outer wall is found a series of chapels, which are three parts of a circle in plan. Upon the inner face of this mass is carried up a clerestory wall pierced with a continuous arcade of semicircular headed windows, and the outer part of the wall over the chapel is roofed with a sloping table of stone. This, with the roof that covered the vaulting of the aisle, and which sloped from the sills of the upper windows, gives the apse externally a complicated double-aisle effect, scarcely warranted by its scale. The finely proportioned transverse arch which formed the opening to the church is pointed and unmoulded, its sole decoration being the soffit roll that emphasizes the apex of each order of the arch, and which is very characteristic of German work of the date. A small portion of the walling of the westward intermediate compartment shows the respond of the plain square pier arcade, the blind triforium recesses, and large cusped circular clerestory window above,—a simple and telling arrangement,



Plan of Heisterbach Abbey. Scale 100 ft. to 1 inch.

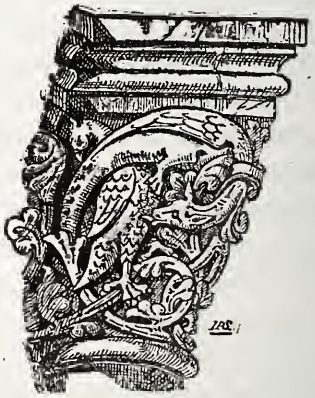
seen to better advantage in the restoration of the entire structure, given by Roisserée, from which the accompanying plan has been reduced; a glance at this will show how delicate and lovely this apse must have appeared at the end of the vista formed of such simple elements as this respond shews the main body of the church to have consisted.

Laach Abbey.



Plan of Laach Abbey, from Fergusson's History of Architecture.
Scale 100 feet to 1 inch.

Laach Abbey is situated in a most romantic and retired position on the borders of the volcanic lake in the Eifel district called Laacher See, at the distance about three leagues from the right bank of the Rhine, below Andernach. The plan of the church, as shown by the accompanying plan, is an excellent and characteristic example of the German Romanesque style, with transept and circular apse, and groups of towers at either end. The enclosed cloister court at the entrance is also a feature once almost universal among the large Rhenish churches, such as those so frequent in the city of Cologne; few, however, of these have been suffered to remain to the present day, so that this example at Laach is of peculiar interest. A view of the central western archway to this cloister is given among this series of photographs, and very beautiful it is. I believe it was seriously injured by fire a few years since, but it has been well restored. It is impossible to look for carving equal in spirit to the old at the hands of modern workmen, and this restored work is no exception, if it be compared with the admirably vigorous carving to the imposts of the doorways leading from the cloister into the aisles of the church, one of the capitals of which is shown in the accompanying engraving. The general view of the Abbey given in this series of photographs is from the north-west, looking over the roofs of the cloister court. The two groups of towers are there seen in their happiest combination, aiding instead of detracting from each other, as they are apt to do, when viewed more in flank, with the long ridge of the nave roof between them, or from the ends where, the further group becomes confused with the nearer. Except for its almost unrivalled and happily varied arrangement of towers, the building is exceedingly plain and of no great size, nor does anything appear to call for special remark save the curious fan-shaped windows in the western walls, which are specimens of the vagaries occasionally presented in these buildings. The detail is throughout exceedingly simple, and a small chapel in the grounds of the Abbey is far more worthy of examination in this respect. The grand effect produced by the array of towers is far beyond what their scale* would appear to warrant, and in this high quality of being able to make the utmost of the means employed. This Rhenish Romanesque architecture is very noticeable and deserving of study.



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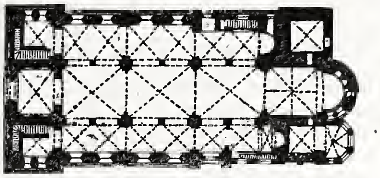
* The highest tower is only 140 feet high.

ANDERNACH.

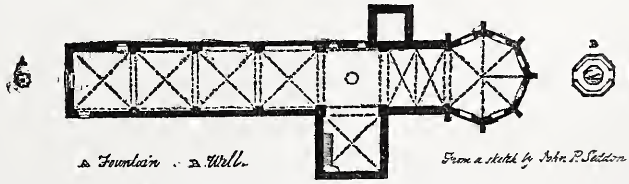
The subjects taken from Andernach Church are strictly architectural details. One is the upper part of the apse of the chancel, the position of which, flanked by a tower on either side, is shown by the accompanying plan. This apse is one of the finest examples, and yields precedence only to those of the Church of Great St. Martin at Cologne, which are arranged in a similar manner with piers over the main division of the principal stage below. The plan of these piers is a square set lozenge-wise, with a detached shaft on each face; between these at Andernach are pairs of arches resting on columns coupled in the thickness of the wall; at St. Martin's, where the scale is so much larger, they are in groups of three, the effect of which is still finer. The cornice in this example is the boldest I am acquainted with, though perhaps open to the criticism of being a trifle too heavy. The tablet band beneath the arcade is poor; in many other examples its recessed panels are deeper and richly moulded, and the panels themselves are filled with black marble or limestone. In the photograph part of the northern ancient Romanesque tower is seen—to the right of the apse, with its couplet windows with their characteristic mid-wall shafts, its basalt quoins, and rubble masonry. A skimming of plaster is seen falling off both the tower and apse; I question whether it was not part of the original design that it should be so covered, and possibly decorated in colour, for the concave recessed panels in the gable, a small portion of one of which is seen in the upper part of the photograph, still retain mediæval paintings in excellent condition. The other two photographs represent the carved imposts of the doorway of the south aisle, with admirable Romanesque details of foliage, birds, and grotesque animals, full of vigour and life, and exquisite in design and modelling.



Plan of Andernach Church.
Scale 100 feet to 1 inch.

SAYN.

The photograph of the west-end of Sayn Church was taken on account of the peculiarly interesting old fountain which stands in front of it. A somewhat similar one exists at Heisterbach, and there are several fonts in the Rhenish church besides that in the church of Sayn itself, designed upon the same principle. Here a large hexagonal convex sided bowl, with heads at each angle cut out of the solid, rests upon six outer shafts, with moulded bases on square plinths. This is set, as it were, round a central large column, the base of which rests on the ground, and the shaft piercing the bowl, bears a second smaller circular one ornamented with carved foliage upon its moulded capital. The fountain plays from a stem finished as a pine cone, rising from the middle of the upper bowl; the material out of which the whole is constructed is a dark limestone. The accompanying plan shows the position occupied by this fountain in relation to the church, which once belonged to an abbey, and has many curious points. Eastward of the heptagonal apse is an open octagonal well surrounded by a seat, and a covered conduit beyond. The painting visible upon the details of the simple late transitional west front of the church is modern, but apparently a restoration of old decorations, which are found profusely both on the exterior and interior. A representation of the head of Our Lord in the octofoiled circle must, however, be excepted, as it is evident within the church, that this circular space was once a window, and not as it would appear, by the photograph, merely a panel.



Plan of Church at Sayn. Scale, 100 ft. to 4 inch.

BOPPARD.

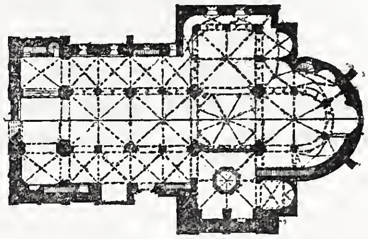
In the view of the east end of Boppard Church, which is so conspicuous an object on the right bank in the ascent of the Rhine, we have given to a sufficient scale, the elegant chancel in the transitional style, with its apse of three sides and two compartments westward. It is a singularly well designed and proportioned example, and its three vertical stages increase happily in richness and vigour of effect as they ascend. It rises from a good plinth course above a high and plain surbase, having simple pilasters at the angles, and five-arched corbel courses to the lower stage, with a circular window in each recessed panel included within them. The principal stage above has on each side three recesses, the central and widest having a semi-circular arch and the side ones pointed, decorated with balls in the hollow mouldings on their edges. They are supported on triple grouped shafts at the angles and single ones between, all banded at mid-height, and with carved capitals. In the central panel on each side is a lofty semi-circular headed window. The open gallery, forming the third stage above consists of a group of four arches on each face, on detached shafts, coupled in the thickness of the wall. The cornice is the weakest feature, and is sadly deficient in boldness compared with earlier examples, as that seen in the photograph of the apse of Andermach Church, before referred to. The two towers which fill the re-entering angles between the chancel and body of the church, are fair but not remarkable examples; they have lost the feature which rendered them notable of old, namely, the connecting gallery suspended in mid-air, similar to the one still existing at Limburg, and seen in the photograph of the west front of that cathedral. This, however, though picturesque and curious, could only be considered a deformity. The object of these galleries seems to have been to have saved a staircase in one tower or else the trouble of going up two. The simplicity of the three lower stages of the tower contrasts well, and enhances the richer design of the chancel. Had this photograph been taken a few years ago, the houses seen in the foreground would, by the picturesque wooded framing of their construction, have aided vastly the effect of the church, whereas their baldness is now only a cause of offence. In a view given in the work by Möller these very houses are shewn in their former condition. The small Romanesque doorway in the tower on the south side is a fine example of much earlier work.

OLD TIMBER-CONSTRUCTED HOUSES AT BOPPARD AND RHENSE.

The picturesque dwellings constructed of timber, which are so characteristic of the villages on the banks of the rivers of Germany, have nearly run out the lease of their existence. The inevitable decay, which sooner or later overtakes all the works of man, is hastened in their case by the perishable nature of the materials of which they are constructed. There are many stone-built houses of Romanesque work of the twelfth century which will long outlast these, few of which date further back than the sixteenth or seventeenth centuries. It is possible that, dolphin-like, they are far lovelier in this their stage of dissolution than they ever were in their prime: they do not often present any very admirable detail, but their outline and proportions are good, and the contrast of colour formed by their framing and panels, heightened by the effect of time, is most striking and picturesque.

Two excellent examples, one at Boppard and one at Rhense, a village a little below that town, form part of this series of photographs. The former of them is noticeable for its richly carved angle posts and the quaint and varied fillings-in of the lower panels of the two upper storeys. These are formed of interlacing timbers, all the points of junction of which are emphasized by small circles or lozenges cut out of the pieces of wood, and filled like the spaces between the timbers with light-coloured plastering. The curved gable above has already succumbed to the slater, as the rest doubtless soon will have to do. In the example at Rhense are several interesting features, such as the projection of the circular staircase above the entrance doorway; the door itself divided into halves, each with four projecting panels, the peaked roof of the dormer and the turret over the angle, which has some good old glazing in the windows, and the curious gallery beneath from which it is bracketted.

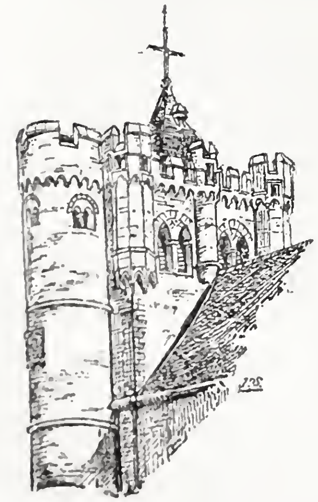
Limburg Cathedral.


Plan of Limburg Cathedral.
Scale, 100 feet to 1 inch.

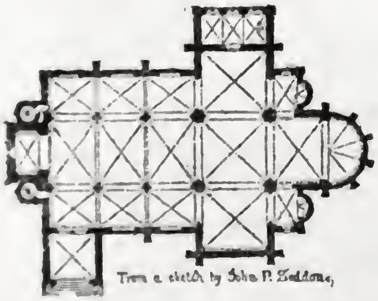
The Cathedral of Limburg, on the Lahn, is one of the finest specimens of the advanced Transitional style of German architecture. It yields to none in point of internal proportion, boldness and vigour of detail, or in external grouping and composition, while for the romantic picturesqueness of its situation it would be almost impossible to find an equal. The plan, shewn by the accompanying engraving, is exceedingly compact, and it is difficult to conceive by looking at it whence its stupendous array of towers can spring. These equal in number and resemble in arrangement, but of course in miniature, those of Laon Cathedral, namely, pairs of towers to the west front and east transept end, and central tower over the crux—seven in all, the last being in this case surmounted by a lofty spire. That building, though so much vaster a structure, seems hardly to produce a grander effect than this, and it is certainly inferior as lacking the pyramidal composition which is attained at Limburg. Standing upon the edge of a precipice on two sides, and with the ground sloping rapidly from it on the others, it is not easy to obtain satisfactory photographs of this exterior. The best is that of the west front, given in this series; those from the side shewing the entire grouping are necessarily distant ones, and need, to do justice to them, calm and fine weather (denied to us during the whole time we were able to stay) are indispensable. The western façade is a fine composition. It resembles much that of Andernach; the towers in both churches are very similar in design, and differ only in detail. But the space between them opening to the nave is far better treated here, having a fine doorway with trefoiled inner arch, and outer pointed archway of three orders with detached jamb shafts and dog-tooth enrichments in the mouldings, and under the gable above is a vast rose window of simple character, just shewing the germs of tracery, the gable itself being still more richly treated, after the same fashion as those of the towers, while the three lower stages of the towers are comparatively plain, having only shallow sunk panels, and add greatly by their contrast to the value of the rest.

The view of the interior, fortunately obtained in spite of adverse circumstances, is very interesting. In the foreground is the nave, with its very German feature of pier arches without any mouldings whatever, and in the chancel beyond they are equally plain, being square with very simple impost mouldings. The triforium is still the old *männerchor* gallery, with coupled pointed arches in the nave and triplets in the chancel under pointed comprising arches, and supported on shafts of red sandstone in the former case, and black marble in the latter. Above this is a passage under the clerestory, similar to that so frequently found in the churches of the Isle of France, as, for instance, the before-named Cathedral of Laon. In this case it is formed by a beautiful group of four arches in each bay, the columns of which in the chancel are of red sandstone of a lovely hue. The single clerestory windows are the only semi-circular arched feature in the view, and as is so often the case with some feature or another in these German buildings, by a comparatively baldness and want of any detail whatever, are out of harmony with the rest. The vaulting shafts are finished with a capital beneath the sills of the clerestory windows, and bear a group of three short columns, separated by pier edges, which take the vaulting ribs, and indeed appear to do duty for a portion of them. An Early French Gothic feeling seems again discernible in this feature. It is easy to see that the next step towards the development of the style would be to abandon the *männerchor*, to raise and enrich the pier arches, and to lower and develope the gallery beneath the clerestory into a triforium, and the improvement of the clerestory itself would be the final touch required. Refinement would afterwards have only the square abaci and bases and simplicity of mouldings to operate upon, and at every stroke some character and vigor would be lost. The interior has really suffered but little; it would, however, be an unmixed good to do away with the wretched glazing of the east window seen in the view, the rococo balustrade to the *männerchor*, and the barbarous jumble of ill taste exhibited in the pulpit, bishop's throne, and the altar with all its fittings; while the exterior would benefit greatly by the taking away of the suspended gallery between the towers and the re-opening of the belfry windows in the second stage of the south-western tower, which are actually built up to make a residence there for some official connected with the cathedral, whose family make use of the principal entrance, leaving the door on the latch or taking the key with them whenever they go for any petty household errand.

Münster-Maifeld.



Münster-Maifeld is one of the principal towns on the high road from Coblenz to Trèves, situated a few miles distant from the Moselle, and about seven leagues from the former city. Its church, dedicated to St. Martin, is, from the character of its site, a most conspicuous object, and from its quaint semi-castellated tower a vast tract of undulating country is to be seen, the effect of which to an English eye is strange and wild, for although it is everywhere cultivated and villages are dotted pretty thickly over it, the absence of hedges and enclosures gives an open moorland appearance, particularly where it joins the rugged volcanic district of the Eifel. The view of its stately church, the plan of which is shewn by the accompanying engraving, is taken from the south-east, in order to show what perhaps is its best feature, namely, the chancel with its polygonal apse of the period of the Transitional style. It presents some notable variations from the usual Rhenish type. It is far wider and larger than that of Boppard, which is much of the same date, and internally it is finer, but externally it is inferior to that example.

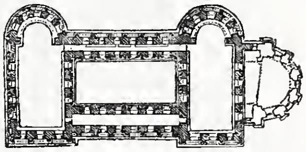


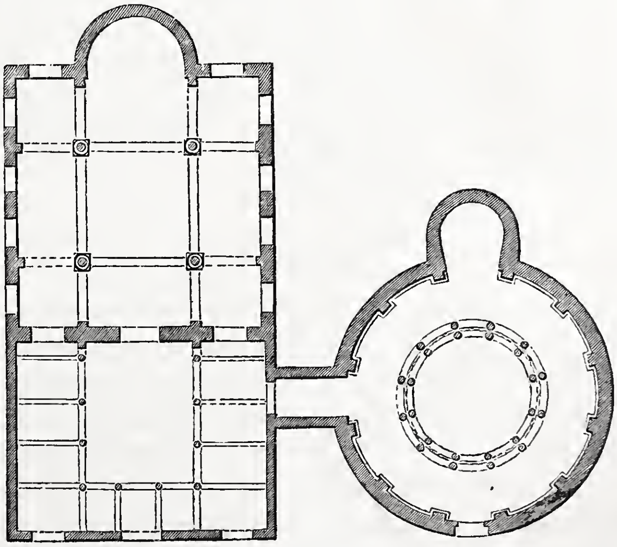
From a sketch by John P. Seddon,

The apse may be said to have four stages in height, as the pediments are so strongly divided by the cornice from the open gallery below; the side compartment westward, however, has nothing above its gallery, and though a buttress rises above its cornice at the point of junction with the apse, the want of unity between them is painful. This side compartment, with its triple arrangement of windows, is very fine. The gallery stage with the pediment to each face, the principal feature of the apse, is also fine and almost a unique treatment, but the cloven roof above is very clumsy and probably not original: if the pediments were roofed separately like dormers it would be far preferable. The two lowest stages externally are bald and poor, but internally they possess some very rich and fine details. All the portion of the church westward of the chancel up to the tower is in the Gothic style, not very good in detail, but cleverly adapted and fine in proportion. It is curious that eastward from each transept is a small projecting chapel with circular apse of Romanesque work, and the noble western tower is also Romanesque, oblong on plan, with flanking circular stair turrets capped by Gothic corbelled turrets and parapets, which give to the structure a very military air.

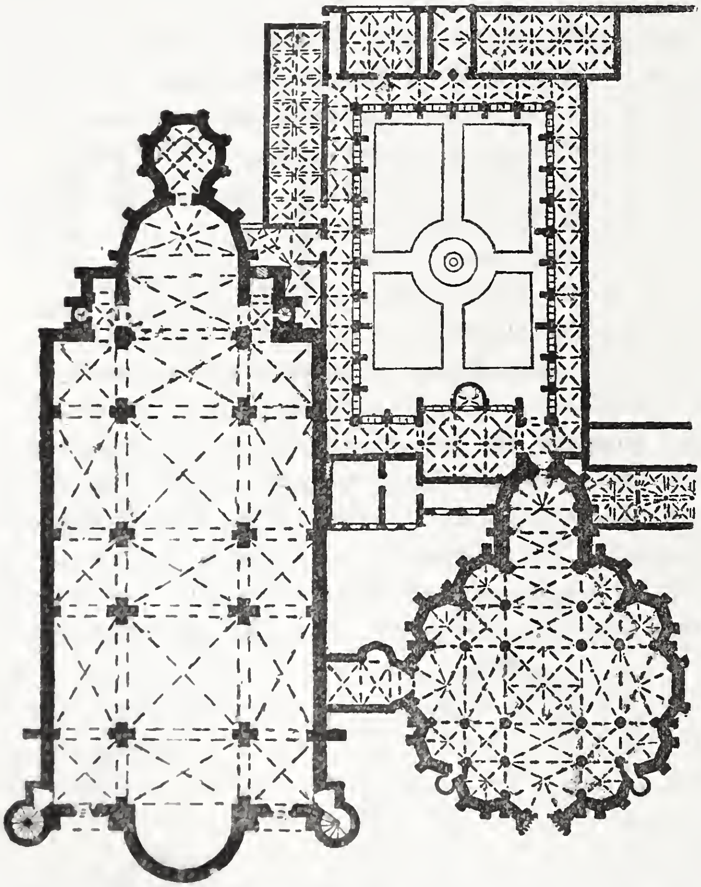
TRÈVES.

The Porta Nigra furnishes one photograph to the present series. The view is that of the side next the city, and serves to show the grand scale adopted by the Romans in their works, since such is the gateway they put to a subject provincial town. It was doubtless designed to act as a *gate of justice*, according to the familiar Scripture term, having in each wing apartments of a basilican character with a circular apse at one end, which formed the raised dais for the throne. There is a great vigor in the architectural design of the building, though the details betray by their coarseness the want of taste which characterized all the works of the Lower Empire. Attached to one side of it is a most interesting apsidal structure in two storeys, surrounded by an open colonnaded gallery. This afforded the requisite accommodation when the wing of the main building was converted into three churches by Archbishop Poppo. It has many peculiar points, such as the strongly developed buttresses, the manner in which the lower string course is broken, round and on the face of these, the lintels instead of arches to the gallery, and the quadrupling of its columns on the top of the buttresses. The cathedral affords interior view and two details, the former of these will repay an attentive examination. The structure is one that has undergone a curious series of transformations, and reveals these by the cropping out, as it were, of its successive strata. The original plan, as explained in Mr. Ferguson's "History of Architecture," from which the accompanying woodcut is taken, was a square building of the Roman era of the time of Constantine, with four colossal granite columns in the centre, and pilasters as responds against the walls. In the eleventh century these were embedded in vast plain piers when the building was turned into a cathedral, according to the plan given in the next engraving, and one of the capitals of the pilasters is seen in the photograph projecting from the plaster on the left hand. This stately but plain, and timber-roofed church of Archbishop Poppo's was, in the thirteeth century, again transformed into one more in accordance with the style then in vogue, by inserting the corbelled pier arches of the nave, one of which is seen in the foreground with the remarkably bold and fine clerestory above, together with all the vaulting from the corbelled shafts. The whole forms a most


Plan of Porta Nigra at Trèves.
Scale, 100 feet to an inch.


Plan of original Cathedral at Trèves.

interesting problem, into which I have endeavoured to go somewhat deeper elsewhere. Almost all the phases of it might be studied in this single photograph. The upper part of the eastern apse is also seen in a view from the cloister court, which is also to be found in this series. The outer shell of this apse was built like a cloak around the older one of Archbishop Poppo, and the upper range of windows and vaulting upon it. It has externally fully developed buttresses and a beautiful open gallery at top, with a triple arrangement of couplet openings on each face. The cloister, though picturesque, cannot boast of much beauty in its tracery. The cathedral is sadly disfigured by pretentious Renaissance and rococo monuments and fittings, and the two details given of arched tomb recesses are very interesting. Formerly, without doubt, they contained recumbent effigies, with paintings within the arches in the wall above. All above the extraordinarily boldly carved archivolt of the single tomb is a doubtful restoration; in the plate of it given in Gailhabaud's work, it appears more appropriately surmounted by a pediment. This is the earlier example, and of the pure Romanesque style. The triple tomb is later, of the Transitional period. It is not known for certain to whose honour they were erected, but it is probable that they were the monuments of the cotemporary Archbishops of Trèves.


Plan of existing Cathedral and Church of Nôtre Dame, at Trèves.
Scale, 100 feet to 1 inch.

The Liebfrauenkirche or Church of Nôtre Dame, occupies the site of the old circular baptistry built by the Empress Helena, alongside of the cathedral. This is a most exquisite specimen of Gothic architecture, being grace and symmetry personified. Its eastern apse is seen rising above the cloister and chapter-house in another of these photographs, but it is the interior of the church which is especially remarkable, and of this it was found practically impossible to take a satisfactory view. The eastern and western portals, however, are each well represented. These are curiously earlier in feeling than the rest of the structure, and have semicircular instead of pointed arches. This necessitates a rather uncomfortable position for some of the spectator angels and saints surrounding the tympanum of the western doorway, in the centre of which the Virgin is seated with the Holy Child in her arms. Anna is seen at the side exulting over the babe whom the parents are presenting in the temple. The Annunciation is the subject of the Sculpture on the jamb, and the figures on the groups of columns on either side are Noah and Abraham, with prophets above. The decoration of the eastern doorway is foliage of the most delicate character, the vine occupying the tympanum under a trefoiled shaped arch.

Mr. E. I'ANSON, Fellow.—I would call the attention of the meeting to the useful Society by whom these works are exhibited. We are much indebted to Messrs. Cundall and Fleming for the long attention they have paid to this work; but I take this opportunity of calling attention to a Society which has done good service. It started by exhibiting annually, a series of architectural photographs on the walls of the gallery below, and after passing through many trials it has assumed this shape, and its photographs are issued at very moderate prices. I may say, I am one who is very cosmopolitan in my love for all styles of architecture; whatever is good and artistic commends itself to me, whatever its nationality may be. There are among the photographs now exhibited, two which are of great interest: one is the Cathedral of Limbourg, and the other the beautiful interior of the Church at Trèves, which adjoins the Cathedral. It is a small structure, but it is as perfect a specimen of architectural composition as it is possible to conceive. The Cathedral of Limbourg is a most interesting transitional structure between the Romanesque and the earliest style of Pointed Architecture; and there is a little church not far from it, which exemplifies the great influence which the large cathedrals exercised in their immediate neighbourhoods. I allude to the Church at Dietkirchen, and there are other churches in the neighbourhood of Limbourg that partake very much of the character of the Cathedral Church; these are in the Valley of Lahn, and are now easily accessible, by means of the railway communication which has been opened to this district within the last few years.

Mr. G. E. STREET, Fellow.—It is too late to discuss so large a subject as that of Rhenish and German architecture; but there is one point on which I feel much doubt as to agreeing with Mr. Seddon. The question is whether such work as that in the beautiful Marien-kirche at Trèves is German or French in style. If Mr. Seddon knew of any documentary evidence as to its being, as he supposes, French work, it would be very interesting; but in the absence of such proof I should dissent from his view. My own impression is that it is a thoroughly German work from beginning to end. We find, in fact, that German influence extended far beyond Trèves itself on the side of France. The town of Metz, for instance, must be regarded as essentially German in its architecture; and there is a church there, dedicated I think to St. Vincent, in which the eastern portion of the Marien-kirche is repeated to some extent in the plan. The churches of Toul are similarly thoroughly German in character. The Church of St. Elizabeth at Marburg is an example, if one is wanting, of the fact that much German Gothic work is extremely pure and good, and I think a careful distinction should be drawn between the numerous fine Early German examples and what is called German Gothic. I suspect that what Mr. Seddon has in his eye is such work as that, for instance, in the Free Church at Oberwesel, characterised by elongated windows with traceries, which have been much, and perhaps justly, stigmatised; but that is a different class of work altogether from that which you have in the Marien-kirche at Trèves, or that which is found in a vast number of early examples throughout Germany. In fact, it does not do for us Englishmen, proud as we may be of our own buildings, to hold up to contempt the singularly fine early churches of Germany; and believing as I do this church at Trèves to be German in style, I venture to say that that country possesses in it one of the greatest architectural jewels in Christendom. I would only further add that students of German architecture should always bear in mind that the Transitional and Early Pointed styles lasted much longer in the Rhine district than they did in France or England, and that there is a vast amount of work there deserving the most careful study.

Mr. JOHN P. SEDDON, Hon Sec.—I have no documentary evidence whatever on the subject which Mr. Street has alluded to. But after travelling from Cologne along the Rhine it is difficult to feel much sympathy with the Gothic work of that part of Germany; and therefore when this exquisite building on the borders of France is reached, it would naturally strike one that its beauty might be attributable to influence derived from works in that country, and to me it appeared that such was certainly the case from the character of its details.

A vote of thanks having been passed to Mr. Seddon for his paper,

Professor KERR, Fellow, asked leave to notice the presence of Mr. Ware, of Boston, in America, who was about to start for home—who had, indeed, deferred his departure for a day or two (having just returned from travelling on the Continent) in order to be present at that meeting. Mr. Ware, as members would recollect, was Professor of Architecture in a newly-founded college, of what might be called Applied Science, in Boston—the first thing of the kind in America which embraced architecture as a study; and in saying farewell to Mr. Ware it had occurred to him that possibly the Institute might, although perhaps only very informally, allow Mr. Ware to consider himself in a position to say that, if some such mark of encouragement as was given to our own students by the bestowal of medals could at a future time be made of service to the advancement of the study of architecture in America, (as especially the daughter of England in this one of the arts,) no doubt the request for such an act of co-operation would be most favourably entertained by the Institute, whenever the time should arrive. Although no motion on the subject could be then offered, he was sure the meeting would support him in the suggestion that Professor Ware might safely carry the idea home with him in this specific form,—that if at a future time the bestowal of medals by the Institute could be brought to bear upon the promotion of architectural study in America, whether in Boston, as the head-quarters of educational effort, or in New York, for instance, as the head-quarters of professional organisation, it would be looked upon in that room as not only a duty but a very honourable privilege to afford such help.

Professor DONALDSON, Hon, Sec. For. Cor.—I am sure the Institute has great pleasure in cordially welcoming Mr. Ware within its walls, on his return to this country; and now that he is about to depart from these shores, we should desire him to convey to our professional brethren on the other side of the Atlantic, the expressions of our most friendly regards to them, and that we wish him every success, as well as the Institution, of which no doubt he will be a distinguished professor.

Mr. WARE.—Mr. Chairman and gentlemen: It is many months since I had the pleasure of making my bow to you here as a stranger; and now that I am about to return home I see around me many with whom I have the pleasure to be acquainted, and some whom I hope I may be allowed to term my friends. It is a pleasure and satisfaction to me on my return to know that I shall carry with me the expressions of goodwill that have just been uttered, and the cordial feeling of the members of this Institute with which I was greeted on my arrival here.

The meeting then adjourned.

DISCUSSION ON PROFESSOR ANSTED'S PAPER—"THE RELATIONS OF GEOLOGY WITH ARCHITECTURE."

At the Ordinary General Meeting of the Royal Institute of British Architects, 16th of December, 1867.

CHARLES BARRY, V.P., in the Chair.

The CHAIRMAN having expressed his regret that he was not present at the reading of Professor Ansted's paper, proceeded to open the discussion, when

Mr. BENJAMIN FERREY, Fellow, (responding to the invitation of the Chairman) said,—If I had pleasure in hearing Professor Ansted's paper, I have had still greater pleasure in perusing it quietly in my office, and I have no doubt those around me who have done the same have, like myself, found much matter in it that has been valuable to them, and many subjects for reflection and consideration. I have but few remarks to offer upon the paper generally, but there are one or two points to which I wish to refer. I see the Professor calls attention in an early stage of his lecture to the subject of slates. He says, "slates once thought to be crystalline rocks, have been "produced from clays by mechanical pressure. The fissile character can be given to wax, or any other "substance whose particles are sufficiently minute: and all varieties of colour and texture, all degrees "of fissile nature, all the peculiarities of hardness and resistance may be distinctly traced to the "mechanical cause of the phenomenon." Now, if I have been correctly informed by scientific men, slate is a substance which in course of time is liable to disintegration altogether, and being a material formed by compression only, without any chemical cementing medium, it may in course of years become a dangerous material to use indiscriminately for building purposes. Slate has not been introduced largely till comparatively recent times. Its use is now chiefly limited to such purposes as cisterns, landings of staircases, staircases, and sometimes for columns bearing great weight. It would therefore be a serious matter if at any time (we cannot say how soon or how remote) this material should, from causes inherent to the nature of the slate itself, fail. I should therefore like to hear from Professor Ansted his opinions upon that point. I observe, in speaking of the subject of the weathering and protection of stone—and that is a very important one indeed—it has been well remarked by the learned Professor, that the value of stone must depend upon its power of resisting the weather. He remarks, "whatever be the colour, texture or aspect of a stone, however easily it can be procured, however cheaply "it may be worked, its value must depend on its power of resisting weather. Thus the architect must "study stones in the field and in the quarry, if he would know how they will appear after a few years in "his building." Now, a great deal of the stone used in London is powerless to resist the weather. The feeble constitution of the Bath stone generally used is such, that it soon becomes affected by the deleterious action of the London atmosphere, and after a very short time perishes; but if some coating could be devised by which this stone could be protected from the action of the weather, no doubt it would serve as well for its purpose as any other kind; and it has this advantage, being a soft material easily worked, it presents itself favourably to the consideration of all persons engaged in building. Several processes have been suggested for protecting Bath stone, as well as other descriptions of stone. They have been described by Professor Ansted—some of them as being trustworthy, others perhaps not so. There is one, however, which I would mention, on account of its extreme simplicity and cheapness. It is the simple process of the application of soap and alum. I know this has been mentioned several times before, though I fear it has found yet little favour, but I cannot see why such an application should not be made use of, because it is extremely cheap; and though nobody can at present say it will last for a quarter-of-a-century, still I believe it would remain efficacious for many years. As far as my own experience has gone, it has been effectual for five or six years, and I think if the stone were to be coated over occasionally with the simple material of soap, in the first instance, and then with alum, it might have the effect of protecting buildings very materially against the ravages of weather. Then with regard to the other descriptions of stone that might be introduced, the great difficulty is the question of expense. Nobody doubts that we might introduce other stone into London and use it, if we could afford to do so. There are sand-stones, such as that from the neighbourhood of Morpeth—a very capital material, which I used myself twenty-five years ago in London, and the arrises are as sharp now as when they were first wrought. Cefn stone is another, as also the Ruabon, from North Wales: neither of these stones are expensive to work: they work freely, and no doubt would be extensively used but that the cost of procuring them acts as a prohibition to their use in London. I think the railways might offer greater facilities in this respect than they do. If, instead of placing a heavy cost on the weight of the material they would bring it to London at a cheap rate, I have no doubt many lasting kinds of building stone would be introduced largely into the London Market. That is one difficulty we have to contend against. Now, with regard to the tests, Professor Ansted says, "it is our duty to find out stones which will resist the effects of the London atmosphere, and those which will not. But what are the tests? There are difficulties attending them which we hardly know how to meet. We can find out defects of quality in the field or pit, and can find out those stones which are trustworthy and avoid those which are not trustworthy. But we have little certainty that the stone selected in the quarry will be sent to London, unless some person is on the spot to watch the quarrying and see that the particular stone selected has been actually despatched to London for the purposes required. Unless we have some security of that sort, I do not see how we can be certain that the stone we use will prove to be a safe material. We may have a stone of approved character, but if it does not come from the particular beds specified we may find to our great regret and sorrow that that which we expected to be a lasting material proves to be anything but desirable. Another point of importance is the mode of bedding stones. With some laminated stones it is evident that unless they are placed on their natural beds they will rapidly decay; but in the case of other kinds of stones it is very difficult to tell which is the right way of the bedding; and there again we must depend a great deal upon the persons who use them. The subject has been so exhausted by Professor Ansted that there is nothing more I desire to add.

Professor DONALDSON, Past President.—It was with great interest I listened to the reading of this paper by Professor Ansted, and I have read it since with still greater interest and improvement. At the same time it has overturned some of the theories I had been taught when in the class room as to the formation of the crust of the earth, and those systems which hitherto have been accepted amongst geologists with regard to the mode in which the crust of the earth has assumed its present form. The late Dr. Buckland, as you are aware, published a very graphic section of the earth's crust as illustrative of the theory discussed by him. We know, in the first instance, the formation of the crust of the earth used to be attributed by Werner to the action of water, that the several strata of the crust are deposits of substances which have been disintegrated, and these formed the various beds. Hutton did not deem this theory satisfactory; for he considered that fire formed part of the constitution of the several beds of which the crust of the earth is composed. At last geologists seemed to consider it was not due entirely to one or to the other action, but a combination of the two; first that the primitive or lower rocks were to be considered as igneous unstratified masses, and the others were to be considered as stratified deposits produced by the influence of water. It was supposed also that these masses of unstratified matter decomposed, and that then the three series of deposits called the primary, the secondary and the tertiary, were formed of the particles. They are of different epochs, and in these are found the stone of which we avail ourselves for constructive purposes. I have great reliance on what our friend Professor Ansted says; because a gentleman of his experience must be aware, more than an architect, what is the real truth of the case as far as he has been able to investigate it. Granite is a most remarkable basis of rocks, and I should have been glad if our friend had described more of the elementary parts of granite. There are an immense number of ranges of mountains which consist of quartz entirely, and this we find to be the case in some of the Scotch mountains. If you go into Wales you find it in less quantity, though blocks of quartz are used in ornamental parts of cottages, and put into the walls of the buildings of the poorer as well as the superior classes. Now, the granite of Devonshire is peculiar, because occasionally we find it is imperfectly formed, the felspar of which it is largely composed, being so subject to disintegration, that we cannot rely upon it without due care. And yet there are parts where Cornish granite can be relied on just as much as Scotch. We find that London Bridge is built half of Cornish granite and half of Scotch, and the one has proved just as enduring as the other. This mass of granite assumed formerly to be the basis of all rocks, was supposed to be penetrated by veins or fissures traversing the whole body of the mass of the rocks, and that through these cross-joints, veins, and fissures, there were certain igneous rocks of the serpentine and others thrown up, and spread themselves on the surface, and formed those rocks which we now use for the ornamental parts of architecture. These were not substances of deposit, nor really of infusion by wet; but by the heat thrown up and filling up these fissures and crevices which occurred in the primitive rocks, and which caused these fissures by the heat when the expansion took place and the cooling of the rocks left these fissures (I do not now speak of the volcanic series). These porphyritic marbles are found either perfect or imperfect, and there are instances of porphyry, being so bad that in a few years it disintegrates. I had in my own practice a house to recase, because after thirty years the porphyry facing, so imperfectly formed, had disintegrated. I should have attributed this to the heat in the boiling not having been sufficient: but probably our friend will say, the water did not crystallize it enough. But at all events it was so imperfect that we were obliged to take it down and replace it with stone. With respect to the oolite, I do not believe there is on the face of the earth any stone, except the travertine we find in Rome, really better than our own Portland. In support of this I may refer to St. Paul's Cathedral. It has been built above one hundred and fifty years, and if you look at the sculpture there the arrises are as perfect as possible; but Sir Christopher Wren took great precautions in the selection. He had persons on the spot to make choice of the beds and to watch that every block that was sent up was of the best quality. As I have already mentioned, I had to reface this house in Devonshire, and I took Mr. C. H. Smith with me to select the stone, and we found still lying on the surface the very stones which had been rejected by Sir Christopher Wren's agents as not sufficiently good for St. Paul's. The blocks retained the tool-marks that were upon them at the time, and though they had been exposed to the atmosphere for above one hundred and fifty years, the arrises were as sharp and as perfect as when they came out of the quarry. I bought a thousand pounds worth of that stone, and the masons found great difficulty in working it after having been weathered and exposed for so many years, This shows that if Portland stone be well chosen, from the proper beds, we may thoroughly rely on it. With respect to preservative applications to stone, I can hardly conceive that such simple substances as alum and soap can last for more than a very few years. I think you had much better paint the stone. In using stone you do not want a material that will last for five or ten years only, but that will last almost for eternity. Of all the various preservative processes we have heard of, that known as Ransome's appears to give a guarantee of certain durability from the nature of the materials of which it is composed, viz.—silica. I come now to those rocks which are known as the Schists. In Wales it is extraordinary to see in the quarries a wall of quartz of several feet in thickness, cutting through a whole mountain and intersecting the mass of slate. I should very much like our friend to explain this phenomenon. It is a most remarkable circumstance, because how has the slate been formed on one side or other of that mass of quartz which we see? This wall is vertical. There must have been upheaving of the mountain. But was it first slate deposit, then the quartz, and then the slate deposit again upon that? The upheaving would make it vertical by the interior heat of the earth. Or was it one of those veins, occurring from the action of heat in the earth, dividing the rock of slate, and filling it up with this quartz in solution? That is another curious subject, and I hope my friend will pardon me if I allude to those matters which suggest themselves on the perusal of his interesting paper. I feel we ought not merely to take the surface of geology. It is of so much importance that the architect should dive deep into it, and possess all its leading principles. We may therefore congratulate ourselves in having such a paper as this from our friend, because he has cleared geology from much of those extraneous subjects which professional geologists are apt to attach to it. In dealing with it for our practical purposes, he has not treated of the various forms of different epochs, the organic remains of which are found in the rocks, but he has taken the obvious features which appear on the face of the rocks themselves. There are however other matters, such as how the rocks are superposed, which are ably treated in this paper. With respect to the question of oolite-stone, that is a material of great interest to us. Alabaster is here and there treated of in rather opposite qualities, a sulphate of lime being the component parts in some cases, and in other parts treated somewhat differently. It is a material used by us for ornamental purposes, and we have seen it much used by the Italians and French for similar decorative purposes. But we know that alabaster was very largely used by the ancient Egyptians; and I have seen in the Tombs of Ghizeh a gallery completely lined with large slabs of this material. In the great mosque in the citadel of Cairo, built by Mohamet Ali, the whole of the interior is lined with alabaster, but it has been used with such want of taste that the general effect of this material, rich in itself, is poor and insipid. It wants some relief of dark marble or stone to give it emphasis and expression. It will be in the recollection of many that the late Pasha of Egypt sent to the Pope some shafts of alabaster, each composed of a single block, 30 feet in height and about 4 feet diameter, to be used in the erection of the Basilica of St. Paul's at Rome. I now come to the limestone rocks, the origin of which is very interesting. The limestone rocks form a very large portion of the whole surface of the earth, and there is so much analogy in their composition with that of the bones of animals, that it has been stated by some, that these limestone rocks merely consisted of lime, the product of the bones of the animals which lived upon the earth at a certain time. This seems a startling proposition, but whether there is any other mode of accounting for the lime is a matter for curious enquiry. Whence was the origin of the lime? It cannot, I think, have been previously existing to what we used to call the igneous rocks, that is the granite, for we do not find any of this lime in the granite. How is it the lime comes to be alone, so as we find it upon the crust of the earth in the primary (or Palæogon) strata. I have no doubt our friend will be able to solve the difficulty suggested. Some are close-grained and compact limestones, and they may be polished in the same manner as marble. In one of the churches at Paris (Notre Dame de Lorète) the church is like an old basilica, and has columns along the central nave, a double row on each side. These columns were not intended to be polished, but the effect was so dull that they were obliged to be so treated, and it proved a very costly remedy, almost as costly as if marble had been originally employed. With respect to porphyry it is difficult to polish that, because it is a very rotten material. Looking at the surface we find it is full of seams, and a great deal of clay apparently fills up the crevices and cracks. You cannot polish the clay, and therefore it is difficult to get an uniform mass of porphyry or of green marble. It is almost impossible to find a large block of homogeneous green marble or porphyry, on account of the great quantity of clay that enters into the composition of it. With respect to slate we are all aware of the different qualities, and it is within about the last one hundred years only that it has been introduced into general use in London for roofs. In ancient time it was the Westmoreland green slate which was used, which combined well with the decorative parts of a building in point of colour, and was very harmonious. But after a number of years the green slate becomes rotten like a piece of blotting paper, and therefore cannot be so well relied on as the blue slate of the Welch quarries. The former rotted where the lower end of the outer slate laps upon the one beneath. I am also anxious that our friend, if he will pardon me giving him so much trouble, will be good enough to explain more at large than he has done in his paper, the composition of marble. It has been considered that marble generally is a magnesian limestone. Whether it is pure lime crystallized I am not able to say, and I am also at a loss to account for some of the peculiar properties which belong to it. We know how beautifully it comes out in the working. The principal temples of Rome were built of marble, and that material being used for constructive as well as decorative purposes, great expense was of course involved. Mr. Nash mentioned how necessary it is for the young members of our profession to study the quarries. For my own part, I may say I never used a stone but I went to the quarry to see it there, and I invariably took a section of the quarry. It is of the greatest benefit to professional men to make themselves acquainted not merely with one or two, but as many quarries as they can take sections of, so as to understand the qualities of the beds. They almost always follow in the same series—the softer stones at the top and the harder stones at the bottom, down to the blue clay—there being no beds of any stone of greater depth than two feet; there may be two consecutive strata of two feet each, but never one that is four feet deep without an intervening bed.

Mr. William White.—The question has been raised with reference to the durability of slate, and I think that is one of the points in which we are more concerned than any other. There is a slate which has just now been brought into notice, and I was anxious to hear whether anything was known amongst those present as to its qualities in respect of durability. The slate to which I refer, was introduced by Messrs. Randell and Saunders. It is a Cornish slate, but of green colour. It does not cleave into very fine laminæ. From that, I conclude it would be liable to decay in due time, because I believe the more the slate has been compressed, and the greater the weight of pressure to which it has been subjected, the longer will it last, and the finer is its cleavage. There is one description of stone which I do not think has been mentioned, and that is the Tottenhoe stone, a species of clunch, which is found in Bedfordshire, Herts and Bucks, of which so much has been used in the old churches from the end of the fifteenth century, but I think not previous to that. It seems they used better stones in earlier times, and with the decline of architecture, there was a corresponding decline in the selection of materials. I have myself seen that to be the case in Cornwall. There, in later times they used a great deal of granite, which was not used in the earlier periods; but they have one stone found only in a single vein running through the south-east coast, of a most valuable kind. They call it the Pentuan stone. It appears about half-way up the cliffs, perhaps 150 feet high, and the bed seems to be about four feet thick. The mode of getting it is by men let down by ropes from above, and the blocks are thrown down on the beach within reach of the boats at low water, and thence loaded at half-tide. This stone was in great use in the fourteenth century and part of the thirteenth. I referred to the Tottenhoe clunch stone, because it has in every instance that I am acquainted with, gone to decay when used for outside work. But I have several times seen churches, where, after it had gone to decay, it had been plastered over to protect it from further decay; but, upon removing the cement, the stone was found to have gone several inches in depth beyond that, showing almost a more rapid process of decay after being coated with cement than before. In a church in Suffolk, this stone was used considerably, and it has gone to decay very much in the same sort of way. A stone-mason in the locality told me, what he believed to be a remedy against this excessive decay, which I have never heard of elsewhere, and I think it would be valuable if it proves to be durable. I have tested it for three or four years with good success. How much longer it may last I do not know, but, from what I can judge of it as far as it has gone, I think it will add very considerably to the durability of this material. I say this, because some of the stones in the same building not treated in this way, have shown appearances of decay since that was done a year or two ago. The process to which I allude, is getting a number of lumps of lime in a bucket, and letting the water be boiled by the lime, without stirring up the lumps, and throwing the lime-water on to the stone by a brush, taking care not to disturb the lime at the bottom; and that appears to form a fine crystalized infusion of lime. It seems to me that is a thing which would commonly answer the purpose with stone so absorbent. I suppose it is the absorbent nature of the stone, which enables it to take in that infusion better than a harder stone would. With regard to alum and soap, it may, I think, be a protection for a short time against the stone perishing, but I have myself tried it to keep out wet from brick-work, and it did not succeed.

Mr. JOHN P. SEDDON, Hon. Sec.—One of the points on which I am anxious to hear Professor Ansted's opinion, is the class of stone most suitable for London. That raised with regard to slate is also an important question, and I for one should be glad to know what good green or grey slate may be relied on. I have myself used a grey slate from Delabole, in Cornwall, and was mainly instrumental in the opening of some quarries in Pembrokeshire, at Whitland, and near Haverford-west, having had my attention called to some slates upon old buildings in that part of the country, which were good in tone and colour, and which I was informed had been fifty years in use; these have since been introduced into the London market, but my own experience has not been entirely satisfactory with regard to them. They are nice looking slates, but brittle, and some builders have expressed to me a doubt as to their durability, in consequence of which I have not used them lately. The green slate from the North Wales quarries seem to be of admirable quality, but there is so little of it to be got that it seems almost impracticable to obtain it; therefore, if one could know whether the slates I have named or others are to be relied upon for durability, this discussion will result in great practical good. I have already sent some specimens of these slates to the Geological Museum, but the answer I had to my enquiries was, that it was difficult to give a definite opinion from specimens. With respect to the Cefn stone, which Mr. Ferrey mentioned as one which might be introduced into London, I, having used it at Aberystwith, should not be inclined to recommend it, for although I have used it as a walling stone, I found it less suitable and reliable for dressings. Bath stone is so very variable, that it is difficult to express a decided opinion upon it, but, in my own practice, I generally come back to it, and I believe, if properly selected, and you can rely upon the builder you employ, it is about the best stone you can have. I have used it in exposed positions by the sea-side, where it has stood extremely well, and its moderate cost is of course a recommendation. I have also used the Ancaster stone at Great Yarmouth, giving a higher price for it in the hope that it would prove better than Bath. Shortly afterwards I was horrified at Cambridge, on seeing in buildings in progress there, this very stone, apparently in an advanced state of decay before the walls were half up. I went back to my own building to see if anything of the kind was the case there, and though the stone had been far more carefully selected by the builder, yet I made up my mind that it would have been preferable if good Bath stone had been used instead. Dundry is a good oololitic stone, though its use has been discontinued for some time. For the works in the restoration of Llandaff Cathedral that stone was specified, and the quarries were re-opened to furnish the required supply, but as far as I could judge, though this stone is an excellent material, there is a considerable waste incurred from the great prevalence of sand-holes in it. Whether better beds of it will be found I cannot say. One of the most valuable limestones I have met with, is that known as the Camden; it is of a deep yellow colour and exceedingly good in quality, and if it would last in the atmosphere of London, I think there is no stone which would look better, the rich tone of it would be most desirable;

it is rather a hard stone, but it is not very expensive to work, and in that respect may be classed with the Ancaster and other of the hardest Baths. It is almost of the colour of yellow ochre. The Pennant sand-stone found throughout Glamorganshire is exceedingly hard, and I believe it to be thoroughly reliable. Clunch, I apprehend, is a material which is only available for use in the immediate neighbourhood in which it is produced, it being of the nature of indurated chalk, being in fact the bottom beds of the chalk. If used with care, I believe it is very reliable, at any rate for interior work, but if it is used at all green in the winter time, it is liable to be blown to pieces by the frost. I have seen it used in buildings where the carving was as new as when it was first executed. In St. Alban's Abbey many of the tombs are of this clunch, and the carvings on them remain perfectly sharp. I may also just mention the white lias, which is found in Warwickshire, as being an excellent stone for carving, by reason of its close and fine texture, and suitable colour.

Mr. Edwin Nash, Fellow.—I do not rise in the hope of being able to throw any light upon this lithological subject, for it is more lithological and mineralogical than it is geological, and Professor Ansted has treated it in his paper as lithologically as it can well be managed. But I am induced to do so because no one has taken up the point which I brought forward at the previous meeting with regard to fire-stones. The learned Professor has told us that the carboniferous sand-stones are the best for the purpose, and I took occasion to mention the blue Pennant stone, which is one of the carboniferous series; it is too expensive for general use, yet, it is a most admirable material, and very suitable for tombs, for which I have used it with the greatest satisfaction. Since the meeting, I have tried a few experiments upon stones by putting them into a fire and plunging them in a heated state into cold water. The Reigate fire-stone readily effervesces on the application of muriatic acid, shewing the presence of lime; yet, lime is an ingredient which seems to be undesirable in a fire-stone. I put a piece of that stone into a fire for forty-eight hours, and subjected it to wet immediately afterwards, and it remained perfect, thereby keeping up its character of being really a fire-stone; and I think that stone ought to be analyzed for us, so that if we can find other stones analagous to it in composition, and at the same time of large sizes suitable for stairs and landings, such as we so much want in London, and which after being heated by fire will not go to pieces when water is applied, we shall get over one of the difficulties of making fire-proof buildings in London; and I am glad that Professor Ansted gives some hope in that direction with respect to the carboniferous sand-stones. I tried the experiment of forty-eight hours' heating upon a piece of Craiglieth, that stone having been named by Professor Ansted, and while it was red hot, cold water was applied and the stone remained as perfect as when put into the fire. It is a good and well-known stone, but expensive. It seems to me to be of great importance that out of this discussion we should realise some absolute facts, which will be useful to us practically, and I have no doubt there will be several, but let that be one, and if we can elicit a knowledge of stones that best resist the effects of fire, it will be a valuable thing for us, the subject being important at the present moment, because there is an act of parliament in contemplation, by which certain buildings are to be erected in a fire-proof manner, and in which stone is to be forbidden. That sounds somewhat strange, but so it is, and if we can find a stone that will not fall to pieces by the action of water at a fire, we shall have gained a grand point; and I am sure if Professor Ansted, with his thoroughly accurate knowledge (for that is the character of his information), will give us assistance in this respect, we may fully rely upon all that he tells us.

Mr. E. W. Tarn, Associate.—There are a great many sand-stones which are but little known in London; I refer to those of Yorkshire and Lancashire, with several of which I am acquainted. The Yorkshire stone most known in London is that used as flags, landings and sills; but there are in addition to these, some of the finest building stones in England to be found in that county. In proof of this statement, I may refer to the town halls of Leeds and Halifax, which are entirely built of

Yorkshire stone. As far as my own experience goes, I find that the open grained stone stands the external atmosphere better than the close-graineds and-stones; and for staircases I do not think you can have any better material for fire-proofing than the Yorkshire stones. As I have already said, they are little known in London, which perhaps arises from the fact of the Report of the Commissioners having eentered very little into that matter. Thirty years ago, the facilities for railway transit were far less than they are at the present time, but Yorkshire is now so intersected with railways, that the stone of that county might be largely imported into the south, and if you had Yorkshire masons to work it, it would not be more expensive than Portland stone. Care must however be taken not to use it for ashlar facing, which is generally about three or four inches thick, as you are almost sure to get it the wrong way of the bed, when it rapidly disintegrates if exposed to the weather; but, if used in solid blocks and laid properly on the natural horizontal bed, it will last for centuries.

Professor KERR, Fellow, said—We are much indebted to Professor Ansted, because the subject of geology, as applied to architecture, is one which can never be other than full of interest. The real question, of course, is this—given our building stones, and given the evils and difficulties of durability incident to the nature of these stones,—can geology, which is so far the science of discovering the formation of these stones, be brought to bear upon those evils and difficulties so as to help us to understand and overcome them. Now, of course, the use of stone in architecture, or rather building, is simply this:—that mankind from the earliest ages have been accustomed, we shall say, to use this material in the enclosure of edifices, as against the weather. It does not however follow that there is any *à priori* reason why stone should be the material; but, we have never as yet discovered a better, and therefore accept it.

Taking then this material as we at present find it, we may refer—first to sand-stone generally. Looking at it, not geologically, but practically, and by rule of thumb, we may regard sand-stone, of whatever kind, as being composed simply of sand cemented together in various ways by nature. A bed of such substance not cemented together we call sand; and when Nature happens to have saturated this bed of sand with some cementing medium, it is sand-stone. Now suppose I say that I do not know why it is, that sand-stone of some of the most superior kinds has not been much introduced into London building; this is a practical question for geology to answer. In other words, looking at the uncertainty which prevails about the whole subject of London building stone, is it worth while to ask whether sand-stone is not in the nature of things the most promising material for London use? [Professor DONALDSON. It is matter of cost]. I am not as yet speaking of the cost; there are certain buildings in which no cost has been spared, and yet the stone selected has not proved successful.

Looking next at the lime-stones generally, we regard them as masses of concrete (chemical rather than mechanical) deposited from water, we shall say; and when we find that these are selected for London use, whilst they are notably subject to certain disastrous effects of the London atmosphere, we ask geology to tell us, with regard to the formation of these stones (the question being another form of the previous one, if you please to call it so), whether they are really, as I think most of us have been accustomed to suppose, in their nature a superior material to sand-stones; and further, if geology determines that they are really the best material for town atmospheres, then we ask geology to say whether the facts of formation, theoretically, can be made to help us in respect of their practical employment, and perhaps their preservation.

Then, looking in particular at the oolites, Professor Ansted tells us how they are formed; we have been accustomed to think they were formed in another way, but no doubt Professor Ansted is right, and the information is useful. We have been accustomed, I mean, perhaps all of us, to regard oolitic lime-stone as composed of the debris of some pre-existing concrete lime-stone reduced by attrition to the form of egg-shaped sand, and then cemented together by a chemical deposit. We are told that is not so; that the oolitic character is produced by a tendency in the carbonate of lime, when in motion, to form those small granules round certain nuclei. I do not doubt that this is a good theory; but I will call attention to a circumstance which may be interesting and suggestive, as bearing upon the question. A gentlemen, whom I am not authorised to name, but one who has taken part in discussions on stone at this Institute, has been making some experiments with, I believe (although this is his secret) whiting; and he has shown me a piece of what one would pronounce to be oolitic lime-stone, which he had produced by some means, perhaps by heat or electricity, out of this whiting, and I should think certainly not in any such way as to involve motion amongst the particles, or their deposit around any nuclei. I cannot offer you any idea as to how this material had been produced; but I examined it with great interest as an artificial stone of the most distinctly oolitic character.

Then looking next, still in our own way, and not geologically, at the magnesian lime-stones in particular, we are interested in asking of geology to explain what we as architects have never yet been able, as I think, to be made to understand, (I do not think Professor Ansted has alluded to it), viz.—why it is, as matter of science, that the combination of the carbonates of magnesia and lime (the best being in nearly equal proportions), should produce that superior texture and character of stone which we know is produced.

Let us look again at the dolomite formation; that is, crystalline magnesian lime-stone, the best of all stones, according to present opinion. I think we are told by geologists, that it is produced by the passage through a formation of ordinary magnesian lime-stone of what may perhaps be called a current of volcanic heat—this being the reason of the crystalline character. It was on this theory that the stone for the Houses of Parliament was selected; but the result, nevertheless, was in a measure unsatisfactory owing to the circumstance that, whilst the stone of a quarry may be more or less generally a dolomite, by reason of the action of this incidental heat, there may be in the same quarry portions of the formation through which such heat has not passed, and which may prove to be, not merely a less perfect dolomite, but an inferior kind of stone, altogether non-crystalline, and yet at the same time indistinguishable from the other by the eye.

With regard to slate stones, I have nothing more to say than has been already said; but it occurred to me, that there was in one respect a certain analogy between the formation of slate and the formation of *Coignet's betons agglomerés*, and also of Austin and Seely's artificial stone. I refer to the principle of using, for the mixing of the concrete which composes both these materials, the smallest possible quantity of water, and not employing a very heavy pressure but rather a sort of constant punning. The result is a very hard and durable artificial stone of its kind. Whether slate is not produced upon some such similar principle, from a material which otherwise would be but dried clay, is a question. With regard to the durability of slate, I have heard to-night what was new to me. It is a most important thing if we are to understand that slate will not last for even a reasonable number of years. People who are inclined to that opinion ought certainly to enquire into the matter, and say definitely how long they believe it will last. If slate is soluble in water (this being the way to formulate the idea), the sooner we know that fact the better.

There is one stone which has not been mentioned at all to night, and which, in my opinion is one of the very best in England. I ought to have mentioned it with the dolomite; it is the Mansfield sand-stone. It is composed like all sand-stones, first, of granules of indestructible quartz; but the cementing medium is no argillaceous, or simply calcareous, or nominally siliceous medium, but the magnesian lime-stone, crystalline I suppose, of the neighbouring dolomite itself; so that it combines all the advantages of the mere sand-stone with the perfection at the same time, as I suppose, of the dolomite lime-stone.

The question of durability with us architects (and I have been always speaking of durability alone, as the chief question for geological science) is, after all, reduced to two points, at any rate in London and other large towns,—namely one which Professor Ansted will recognize as a practical point; and another which he may not be able to recognize so readily without some explanation. The first point is as to the simple durability or actual resistance to the weather, and the second as to what we call the "colour" of these stones. The simple duration of stone has recently become reduced to the question of its duration in an unusually noxious atmosphere, such as, for instance, that which was selected for the seat of the legislature, a kind of air generated by the vapours of pottery works and bone manure mills in Lambeth, charged with the intermediate exhalations of the Thames. Certainly it must be good stone indeed which can withstand the action of such ungenial gases as these; and really it is a question of great importance for us to understand, whether or not some of the sandstones—especially taking for example the magnesio-calciferous sandstone of Mansfield, which I have spoken of, would not have been on the whole a better material for London than any limestone whatever, or even magnesian limestone. Then as regards colour there is this question—all the world knows it was on this score of colour that we went so far afield in the selection of stone for the Houses of Parliament. In respect of Portland stone we have portions of a building (say St. Paul's) bleached to a cadaverous white, and other portions taking on the hue of a deep dirty black. Now, does any one know whether sandstone would or would not keep better colour in London than these? In any case, if geology comes to our aid, if it could explain what the precise surface conditions are, which favour the putting on of this motley wear, the information would be very useful.

With regard to the artificial preservation of stone, that is not a question raised in the paper, but I cannot help alluding to the extremely ingenious artificial stone of our friend, Mr. Frederick Ransome. Anything more ingenious in the way of an imitation of Nature has never, I think, been devised; and I am happy to hear Professor Ansted say, that in addition to other merits, he considers this ingenious material to be a good fire-stone. But, to keep to the point, I understand Professor Ansted to say, that Bath stone, if prepared on Mr. Ransome's preservative principle (that is—using silicate of soda with chloride of calcium), before being placed in the wall rather than after, would in his opinion be rendered highly durable. Might I ask, whether he thinks the same process would answer in the case of the slates which we have been told are so liable to decay?

There is, lastly, one question of my own, which I should like to be permitted to submit to the learned author of the paper before us. There was an idea, which appeared a very ingenious one, started some time ago by a Mr. Westmacott, namely, that lime mortar placed against natural limestone hardens rapidly, by the abstraction of carbonic acid from the limestone. Chemists all declare that this is a delusion; that the stone cannot part with any such carbonic acid. Nevertheless, Mr. Westmacott patented the principle; and he considers that, if lime mortar be prepared with a certain proportion of bruised limestone or chalk, the induration will be enabled to proceed rapidly by the abstraction of carbonic acid by the hydrate of lime from the chalk. Of course, when the chemists deny this, we are quite at fault; but there is still this fact to be accounted for, namely, that when, as I am told, an old limestone wall is pulled down, the mortar joint is found to adhere to the limestone surfaces with a tenacity which is otherwise unexampled; indeed, it was upon the observation of this fact that Mr. Westmacott based his theory. Possibly Professor Ansted may be able to suggest a reason for this.

Professor ANSTED rose and said, I will endeavour to compress into as few words as possible the reply which I have now to make to the various questions which have been put to me, as far as I can collect them and put them into any order on so short a notice. I will begin with one of the last points to which Professor Kerr directed attention, that is, with reference to the value of time in consolidating mortar. It is the universal experience of all persons who have examined old buildings that time does unquestionably produce an amount of hardening upon mortars and other binding material exposed to it, which no other process can produce. Therefore, whatever the reason may be, we may be sure exposure will improve all cements, which is the main point of that question. There is one other question of Professor Kerr's with regard to the probable effects of Ransome's process applied to slate. I do not think it is applicable to slate or, indeed, to anything but the more absorbent limestones.

A very important series of questions occurs with regard to the London stones; but before I proceed to that I will answer the question of Professor Kerr with reference to the help which geology may be expected to give to architecture with regard to materials for building purposes, and this will afford me an opportunity of mentioning why the grits are not used in London. The first reason would be, because all the grits of any importance that would be used for domestic architecture, except for the most expensive buildings, are out of the question on account of cost. You see at any rate, then, that I do not ignore this question of cost, which, on the contrary, I have been in the habit of regarding as a very important one. No doubt many of the sand stones, especially those of Yorkshire, and most especially those of Scotland, are, as building materials, exceedingly to be preferred, so far as durability is concerned, to many other kinds of stone. Speaking, not as an architect but from general knowledge, I may say, that one very good reason why this stone would not be employed largely in stone buildings is that it is not adapted for those artistic decorations which are generally preferred in domestic and church architecture. Sandstones only lend themselves to large forms of decoration, and thus when sandstone is used and an attempt is made to work it into delicate ornamentation, it is likely to fail. Thus it is not only expensive to procure, but the ornamented parts constructed of it are liable to injury from exposure. All the stratified grits are more or less absorbent in the planes of stratification, and when moisture gets in they scale when the first frost attacks them. Many sandstones that will stand exposure in the block will fail when badly placed. Others, however, are very durable and exceedingly compact.

Limestones are, no doubt, used because they are so easily to be had at a moderate distance from London. We are not situated near any good sandstones, and our buildings naturally take the complexion of the surrounding country. Till a recent period we have had no railways to carry stone, and I need not point out that even now to convey stone by land carriage, for even short distances, on a large scale is a very serious mattor; in fact, it can only be done at a price which renders its use almost prohibitory in this quarter of the kingdom for common purposes. For this reason I imagine that the excellent stones of Yorkshire, though adapted for house purposes and the styles of house decoration recently introduced into London, have hardly yet reached their proper position among materials. If they could be carried at a moderate price, if they could be brought here in such a form as to be immediately available, I have no doubt they would be welcomed, and I am satisfied, both from their lithological character and their general properties, that they would be exceedingly valuable, and recognised as superior for many purposes to any of the limestones now in use, for they possess the advantage of resisting fire. The reason why limestones do not resist fire is very clear. They become converted into lime, and fall to powder when touched with water. The reason why some sandstones, like the Reigate, do not injure by exposure to heat is, that the proportion of lime in them is so small that the texture of the stone is not injured when exposed to burning, and they only become more porous than they were before. I think what I have just observed answers two or three questions with respect to the important subject of fire-resisting material.

Passing from the varieties of Yorkshire stones, which form a large and important series belonging to the carboniferous system of rocks, and including the members of that series north of Derbyshire and Nottinghamshire, I will say a few words concerning the grit stones which are found in the two latter counties. These stones are of the first importance, and are not sufficiently understood out of the immediate district in which they are got. The remarks of Mr. Tarn on that subject are deserving of every attention from those interested with respect to buildings in the metropolis.

The group of stones used in the neighbourhood of Lancashire, referred to by Mr. Seddon, is, of course, very important. He also referred to the Bath stones, which he regards as of great utility, and of course, judging from the enormous extent to which those stones continue to be used, from the many excellent properties they possess, of which perhaps the great facility of working is amongst the most important, they are really very valuable materials. There is, I believe, no doubt that the better qualities of Bath stone are amongst the best of that class of oolites that can be used. They must not be compared with Portland, for they do not approach it in the more valuable qualities, but they are sufficient for other purposes. The Ancaster and Ketton stones are other varieties, and some of them may have properties which render them locally more applicable than the Bath; but none of them approach the Portland, and they cannot even be regarded as belonging to the same class of stones: the Portland, though it is a true oolite, passing into mere rag stones, and being sometimes entirely made up of fragments of fossil shells, and corals. It is, without exception, a composite material, consisting, however, almost entirely of carbonate of lime, with a very small proportion of silica. The silica does not alter the nature of the stone, but perhaps has something to do with its remarkable hardening quality. Some buildings exhibit remarkable examples of durability against the effects of London atmosphere. I remember my attention being called to the stone exterior of Greenwich Hospital by the late Sir Charles Barry. He well knew the value of Portland stone, and he pointed out that material as even excelling in its properties some of the common varieties of marbles occasionally used in a dry climate like that of Italy. Since then I have myself compared the appearance of such buildings as Greenwich Hospital, where the stone has been fairly exposed for a considerable period, with such buildings as Milan Cathedral, composed of marble, and also with some of the great buildings of Greece and Italy, constructed of the compact limestones found in those countries, and almost approaching marble in their properties. As far as my own ideas of colour and effect go, the Portland stone loses nothing by the comparison. I repeat now what I have said in my paper, that for all practical purposes we have in the better qualities of Portland one of the finest materials amongst the limestones that can be found in any part of the world.

The material called *clunch* has been referred to. It is nothing more than the lower part of the chalk, containing a good deal of argillaceous and siliceous impurities. The per centage of these is sufficient to alter the character of the material. As a stone clunch is not very porous, but it holds in its natural state as a rock an enormous per centage of water. When dried and used either for the inner walls of buildings or for parts always sheltered from weather, it is a very useful material. It was adopted rather largely in the churches of the 13th, 14th, and 15th centuries, and indeed in most Mediæval churches in the middle east of England. A great part of the interior of Ely Cathedral is constructed of this stone, and no doubt it would have stood exceedingly well if it had not been for Cromwell's soldiers; it suffered more, at any rate, from violence than from exposure and time. This stone is useful, but cannot bear exposure to the external atmosphere in a climate like that of England, and no builder of the Middle Ages would have used it under such circumstances. Where it is found to have stood well it has been protected by some harder and more durable stone placed outside it as a facing. Thus protected, clunch is as good for interior work as even Caen stone.

Passing from the extremely soft materials amongst the limestones to the extremely hard ones, I have several notes of remarks which have been made with regard to marbles. Professor Donaldson alluded to this subject, and suggested that I should give some account of the peculiar organization of marble. There is a great difference in the composition of marbles, in every sense, and it is as desirable that the architect should have a knowledge of the different varieties of limestones called marble, as that he should be familiar with limestone itself. Some of the materials called marbles are nothing more than limestones hardened, and sufficiently compacted to be able to take a sort of imperfect polish. These are rather largely used for ornamental purposes and chimney pieces. We pass from them through stones exhibiting an almost indefinite variety of feature and colour—some with one kind of vein or streak, and some with another. Some are coloured with iron, some with magnesia, and some with copper, in various ways. Some contained so large a quantity of carbon as to be brilliantly black. We pass from these to a particular variety of limestone crystallized more perfectly, but not into transparent crystals, and called *par excellence* marble. I have seen specimens of true marble distinctly stratified, and these, though not applicable for statuary purposes, might have much value for the architect. For his purposes, indeed, they may be better than statuary marble of a finer kind, for they are harder, and more compact. In them, however, the lines of stratification are visible, and there are sometimes particles of iron or other impurity collected together near the planes of stratification. These stones have been so altered by metamorphic action in the interior of the earth as almost to have lost their texture, but it still remains half concealed. Generally speaking, in large districts of limestone, where the rock has been long acted upon by chemical force producing change and metamorphosis, we find large crevices filled up with *saccharoidal* limestones, or true marble, having that peculiar texture which distinguishes statuary marble. This character, though not very common, is exhibited in varieties of marble which have been long known and extensively worked in Greece and Italy. Similar material has been introduced from Algiers, and even from Ireland, and specimens have been found in the neighbourhood of the Pyrennees. But wherever I have traced true statuary marble it has always been in similar veins. This, then, is the essential difference between marble and limestone. Limestone becomes marble when in a peculiar form of semi-crystallization. When perfectly crystallized it takes the form of spar, but in this state does not appear to be very abundant. Such spar is, however, common enough in the veins and fissures in limestones, and even marbles. Limestone thus puts on various forms in the earth according to the changes to which it has been exposed, the processes that have acted upon it, and the foreign substances or impurities that were present in the original deposit of calcareous mud from which the whole was derived. The conditions tending to produce statutary marble are not distinctly known, but they do not seem to have been very common. On the contrary, the conditions under which the common coloured and fossil limestones were formed must have been common enough at all times. Of the different marbles, the Parian and Carrara are the two types, and they are sufficiently distinct. The marble of India resembles the Parian. We have reason to suppose that, like the fine statuary marbles of Italy, it is obtained entirely from veins. The question, then, of Mr. Donaldson may be considered as answered, so far as I am able to answer it, but the subject is one which deserves very careful consideration.

Professor Donaldson also alluded to the question of alabaster. I mentioned in the paper that there are two varieties of stone that go by the name of alabaster, the one being the delicate white and beautifully coloured *sulphate of lime*, chiefly obtained in the neighbourhood of Volterra, on the road between Leghorn and Rome. The finer kinds of this material are only found in large blocks, but the more common kinds, called gypsum, are obtained abundantly in bands in many parts of England, France, and Italy. The finer as well as the commoner kinds of alabaster are all of the same mineral composition. But, besides these, there is a substance known as "Oriental alabaster," much adopted formerly, and re-introduced lately, for ornamental purposes in Rome. It was this material which Mahomet Pasha sent to Rome for the ornamentation of the magnificent basilica of San Paolo, and the shafts constructed of it are amongst the finest specimens of the material that have been sent out of Egypt. Specimens of Oriental alabaster were exhibited here in 1851, and others at the Exhibition just closed in Paris. They are varieties of stalactites, or stalagmites. They are exceedingly transparent, and that is connected with the process of their formation. They are formed by the slow evaporation of water, containing carbonate of lime, dropping into or upon the floors of caverns into which this water as drained.

I was surprised to hear Professor Donaldson speak of porphyry as a rotten substance, and mention that clay fills up the cracks in this remarkable rock. I do not agree with the expression, "clay filling up the cracks" in porphyry. No doubt all rocks made up of crystals embedded in a base less pure than the crystals themselves are composed of materials, partly harder, and partly not so hard, as the average of the mass. Porphyry is composed of materials very hard, but some of them are certainly less hard than others; therefore, using the same materials to polish the whole surface of the stone, you get a higher polish on the softer part than on the harder, and by the time you have polished the harder parts you wear away the softer; but I think when you consider the porphyries of Egypt, of which Sienite is a common variety, or those of Sweden and Russia, which have come into use for ornamental purposes, you cannot regard porphyry as, in any case, a rotten material. I do not think porphyries, in general, can be considered as rotten in the sense of having clay cracks, and it is certain that, if these were common in any sample, it would not be selected for ornamental purposes.

The Cornish granites are sometimes called porphyries. Some of them are crystals embedded in a base, and very often the base is a felspar that decomposes rapidly, or is a quartz, which rapidly disintegrates. Large crystals of felspar, and crystals of mica, are the usual constituents of porphyry. Sometimes the crystals are hard and bear exposure for a very long time indeed. This is particularly the case with the crystals which stand out on the pavement of London Bridge. Sometimes the felspar decomposes, and the quartz stands out in an irregular manner. In all cases there is a liability in rocks of this kind to unequal weathering, but, in spite of that, the porphyritic rocks of all kinds are usually selected as the hardest and best materials where great durability is required. There is, however, a very important cause of change in rocks of this kind, which, perhaps, is not sufficiently regarded by architects and engineers. A granite may look well and appear to be of first-rate quality. It may be exceedingly hard, and may seem as if it would last for centuries, and even for thousands of years; but the composition of that granite may shew a source of weakness. All felspar contains a certain quantity of alkali, either soda or potash. Now, there is little difference in appearance between granites composed of these two varieties, but a very important difference as far as the durability of the material is concerned. Thus a knowledge of the chemical composition of a building material, and some reference to the science of chemistry applied to matters of this sort may, in some cases, be exceedingly useful. Unfortunately, this has not always been attended to. A case of this kind came before me not long ago, in the course of a professional enquiry. A large and important work was in progress, and the contractor for the work desired that the materials used should be of the best possible quality. I was asked to examine the material submitted by the contractor, and to give an opinion as to its quality. If I considered it good, this material was to be used, as in other respects the contract was a satisfactory one. I doubted the quality of the material, and had it examined chemically. The opinion of the chemist who analyzed it, and ultimately that of the engineer himself, was not altogether favourable. It was a stone which would wear rapidly in comparison with other granites. Still, as the contract was a good one, and as there was liberty of reference to government engineers, who had used it for public works, our opinion was overruled, and the work is now going on with the material in question. In this case the whole weight of the responsibility rests upon a report of a Colonel of the Royal Engineers, that the material was a good one, and that he had himself used it, although without special examination, for government purposes. It seems to me, however, that in matters of this kind it is not quite safe to refer entirely to military authorities, who, after all, are not omniscient by intuition. Such is the force of authority and interest that those engaged in public works will sometimes act against their judgment for want of faith in science.

As to the theory of the primitive rocks and the composition of granite, and matters of that kind, I should be happy to enter into those subjects, as suggested by my friend Professor Donaldson, but I should occupy too much of your time were I to do so now, and explain the whole of the reasons why geologists have come to the conclusions to which I have already made allusion. I may say, however, that most geologists of the modern school, and those who have thought for themselves on the matter, and are indifferent to the voice of established authority, appear to have come to the conclusion that all rocks that have yet been examined are recomposed from other rocks, and that at the present time on the face of the earth we do not really see anything that belonged to its original nature. What we now see are the results of changes that have been going on upon and beneath the surface of the earth from a time so distant that we cannot judge of its amount, or of what took place before those changes commenced. We have no evidence of the real interior of the earth, for all we have to deal with is its crust. We do know something about that—not very much perhaps—but it is enough for our purpose as practical men, and enough to lead us to theoretical conclusions which, as scientific men, we feel an interest in. As far as architecture is concerned, it is enough to know what is the probable origin of these rocks, without considering how far that origin is connected with the interior condition of the earth.

There was another subject referred to by several gentlemen who have spoken—that is the subject of slates. With regard to this matter there is no doubt whatever that slate, in the ordinary sense of the word, is simply a compressed clay, but, like all other substances that have been exposed for a long time to the action of forces that are slowly producing their effects in the interior of the earth, the clay, like the limestone and sand, has undergone a certain amount of change. The effect of pressure on a substance like clay is very different from that produced in sand or limestone, and is far greater than we can perhaps certify. The result of pressure is two-fold; first, it has a physical effect of a very important kind, bringing into play the attraction of cohesion. When brought about in this way cohesion is sometimes complete enough to produce a material perfectly compact. The particles are in fact cemented together; and in this way slate, in the natural course of things, is quite as compact as quartz, and, in this sense, I believe practically indestructable. But if you employ friction, and rub over the surface of the slate, you will of course obtain a removal and severance of the particles, and it will be the same if you do so with quartz; only, in the one case you get a *clay*, and in the other case you get *sand*. The sand may seem very natural, and the clay may seem strange, but the case is very simple. In that sense slate is liable to deterioration. Of course there are bad slates, and why are there bad slates? Because all slate having been compressed, and the compression being unequal, there are differences of cohesion. The slates also being formed originally of very different materials—never of pure clay—it is only when exposed to those electric and magnetic currents which produce an effect in the interior of the earth that it becomes comparatively pure: and one of the results of change is the production of those peculiar veins of quartz to which Professor Donaldson directed attention, and which areamongst the most remarkable phenomena of quartz.

In the composition of slate it seems likely that the removal of a certain amount of moisture produces contraction in the mass, and thus are derved fissures, which are of necessity filled up by the substance which remains after the silicate of alumina has been brought together; but every one who knows the appearance of a slate quarry knows that besides veins of quartz there are also numerous crystals of sulphide of iron (iron pyrites), which are derived from the sulphur and iron present as impurities in the clay of which the slate was formed. The slate becomes a pure silicate of alumina, the foreign substances having been separated by the action of those forces which are constantly arranging and re-arranging matters in the interior of the earth. It is in this way that veins of quartz have been produced in the great masses of rock I refer to. There are many varieties of slate—some good, some indifferent. Some are capable of being split into exceedingly thin films—so thin indeed that it is not determined what the limit is. I believe the highest quality of slates are those which split most perfectly. At the same time there are excellent slates which do not split thin, which are only fissile to a certain extent, but which may be trusted thoroughly for architectural purposes. Thus, it is not absolutely the case that slates which will not split finely are not as good as those that will.

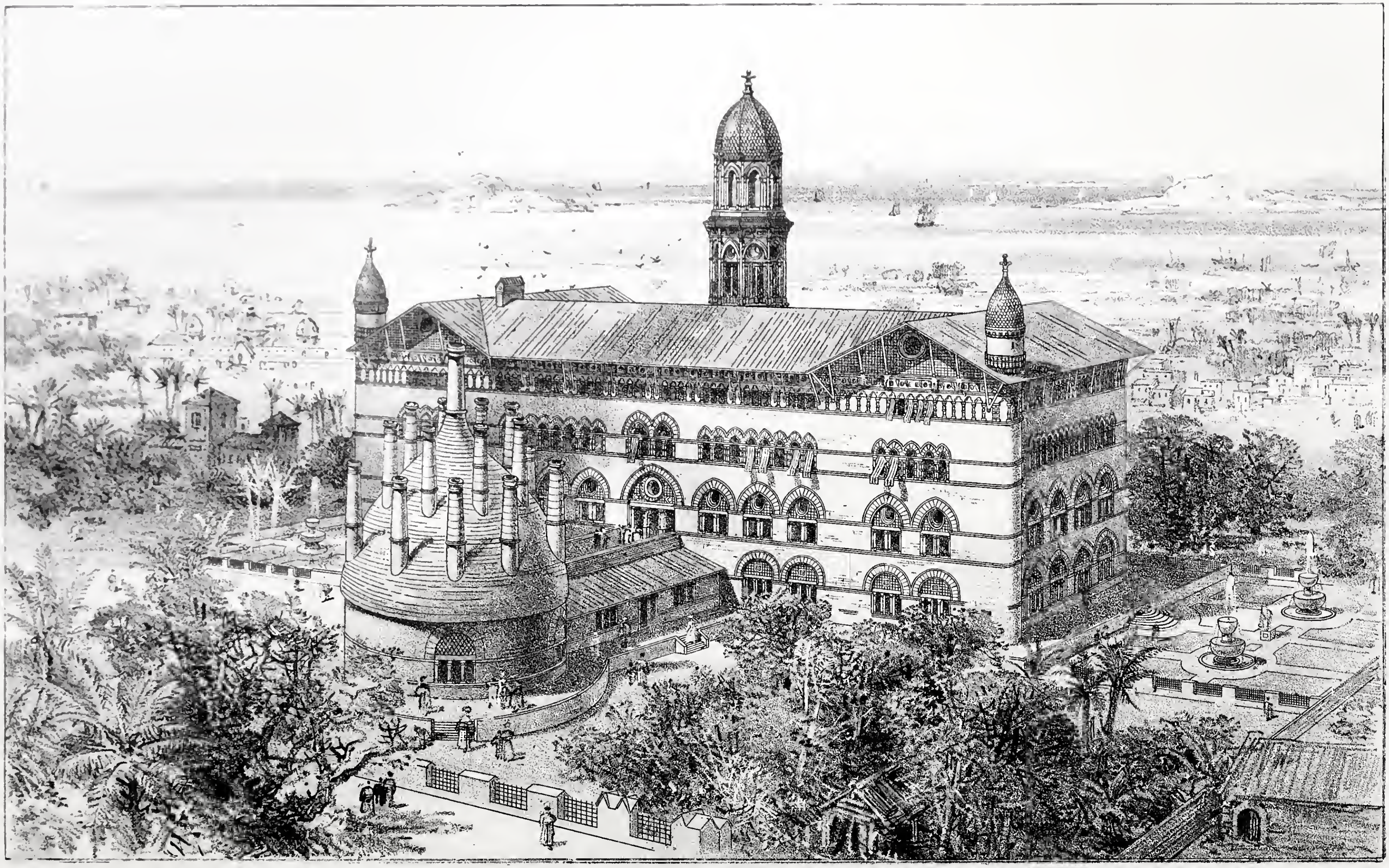
Generally those slates which split most finely are manufactured into slates of comparatively small size. The explanation of the matter is simple. I believe the thick slates or slabs have been less completely pressed, but are just as pure in their composition as the others; some may have been less squeezed by the circumstances and conditions of upheaval, others may not only have been squeezed vertically, but also laterally, as against some unyielding wall in the interior of the earth. The former may also have been less exposed to those forces which re-arranged the particles, and which perhaps produced the most delicate of the splitting planes.

There is but one more subject to which I will direct attention, and that is the question of the material that may possibly render stones more able to resist the weather than they would be naturally. There is no doubt whatever that a considerable variety of materials may be used for this purpose. Paint, we know, preserves stone for a short time—for months at any rate, and under favourable circumstances for a few years. Soap and alum can, I think, do little more than that, but may also be successful for a short time. But though useful in that way, they cannot have a permanent effect on the material, or communicate the power of resisting exposure and weathering. As I have said before, I believe the only material that is likely to answer the purpose is one of those that produce a coating of silicate of lime over the surfaces of all the different particles of limestone near the surface. This is most easily done in the porous limestones which absorb readily; and I think it would be effected if the stones were washed with the silicate of soda and chloride of calcium in the manner patented by Mr. Frederick Ransome, and kept sheltered for a certain time before being used. The probability is that, so treated, very inferior and cheap limestones would last as long as the most costly qualities of limestone. Such an operation may be performed after the stone has been dressed for use; and in this way stone may be much improved. I have said before that I do not believe any process has been introduced—and that I doubt whether any can be introduced—which will prevent stones placed in a building, and already showing signs of decay, from continuing to decay. You may temporarily check the decay; you may do it for many years; but that you can stop the decay, I do not think is likely; for when once the moisture has thoroughly penetrated into stone, we know that the splitting power of frost will throw off any films of foreign material from the surface, and then the whole thing has to be done over again; and this would practically be as difficult and costly as repainting, or recoating with any of those materials that have been suggested.

I believe I have now answered most of the points which appeared to me the most important in the remarks that have been made to-night. It has given me great satisfaction to have been present, and to have listened to the remarks that have been made. I hope that what I have said may have been of some interest, and may not be without its use to those who have done me the honour to listen to the paper itself, as well as to the additional remarks with which I have occupied so much of the time of the meeting this evening.

Professor Ansted resumed his seat amidst loud applause, and a vote of thanks having been passed to him for his remarks in answer to the various questions raised during the discussion, the meeting adjourned.

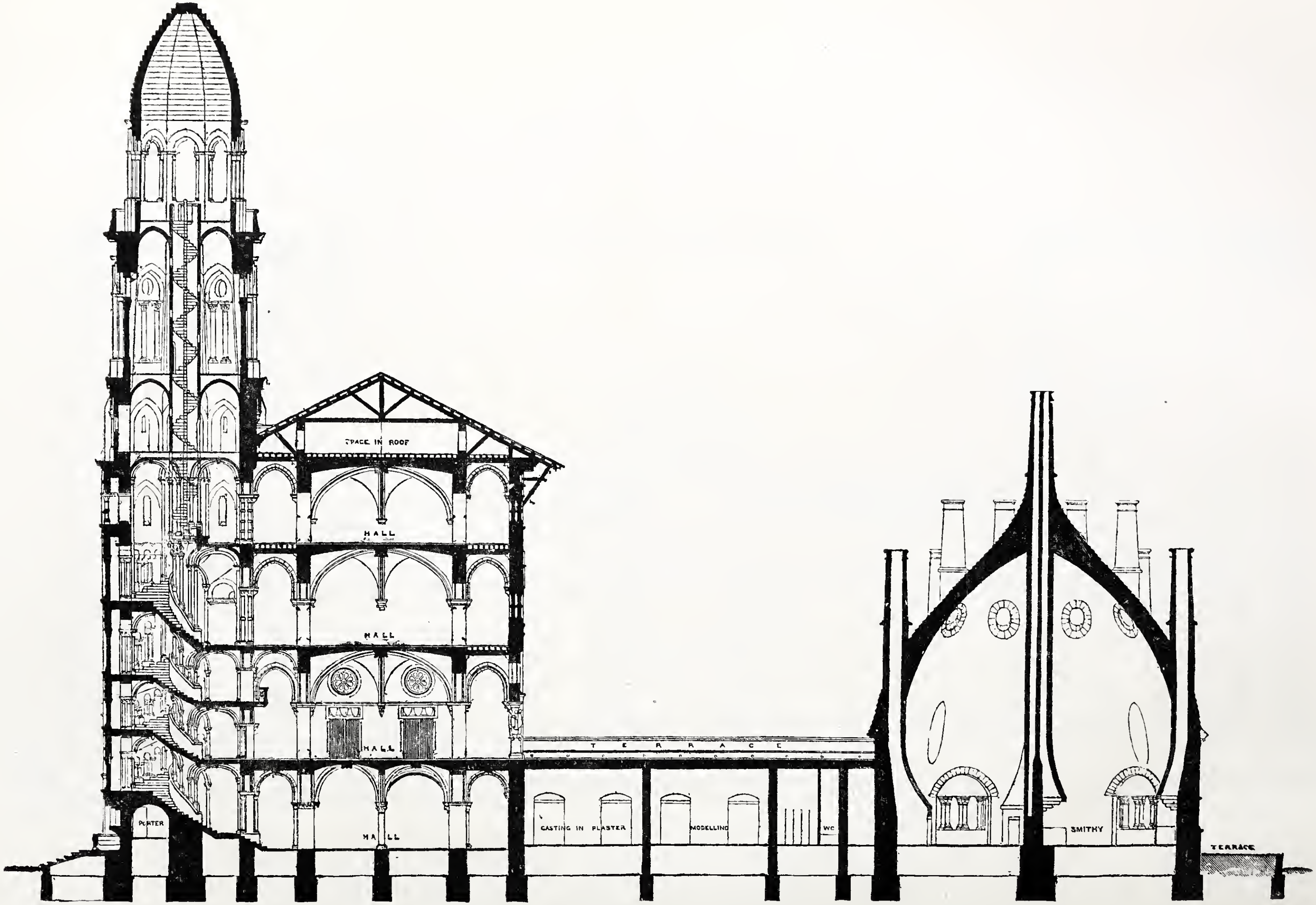
Mr. Wyatt Papworth, Fellow, begs to inform the members of the Institute of a very valuable publication issued by the Government, containing accounts of the several stone quarries &c., in the various counties of Great Britain and Ireland, being somewhat supplementary to the important Report and List furnished in 1839 by the Commissioners, on the occasion of selecting the stone for building the Houses of Parliament. This octavo volume of 380 pages is entitled "Mineral Statistics of the United Kingdom of Great Britain and Ireland for the year 1858. Part II, embracing Clays, Bricks, &c.; Building and other Stones, with sundry Earthy Materials." 8vo. 1860. It can be obtained at Messrs. Longmans and Co. for five shillings, and affords trustworthy observations of much value to the architect.



W. Burges, Arch^{t} 15, Buckingham St.

Kell, Bro^{s} Lith. Castle S^{t} London, E.C.

SCHOOL OF ART, BOMBAY.



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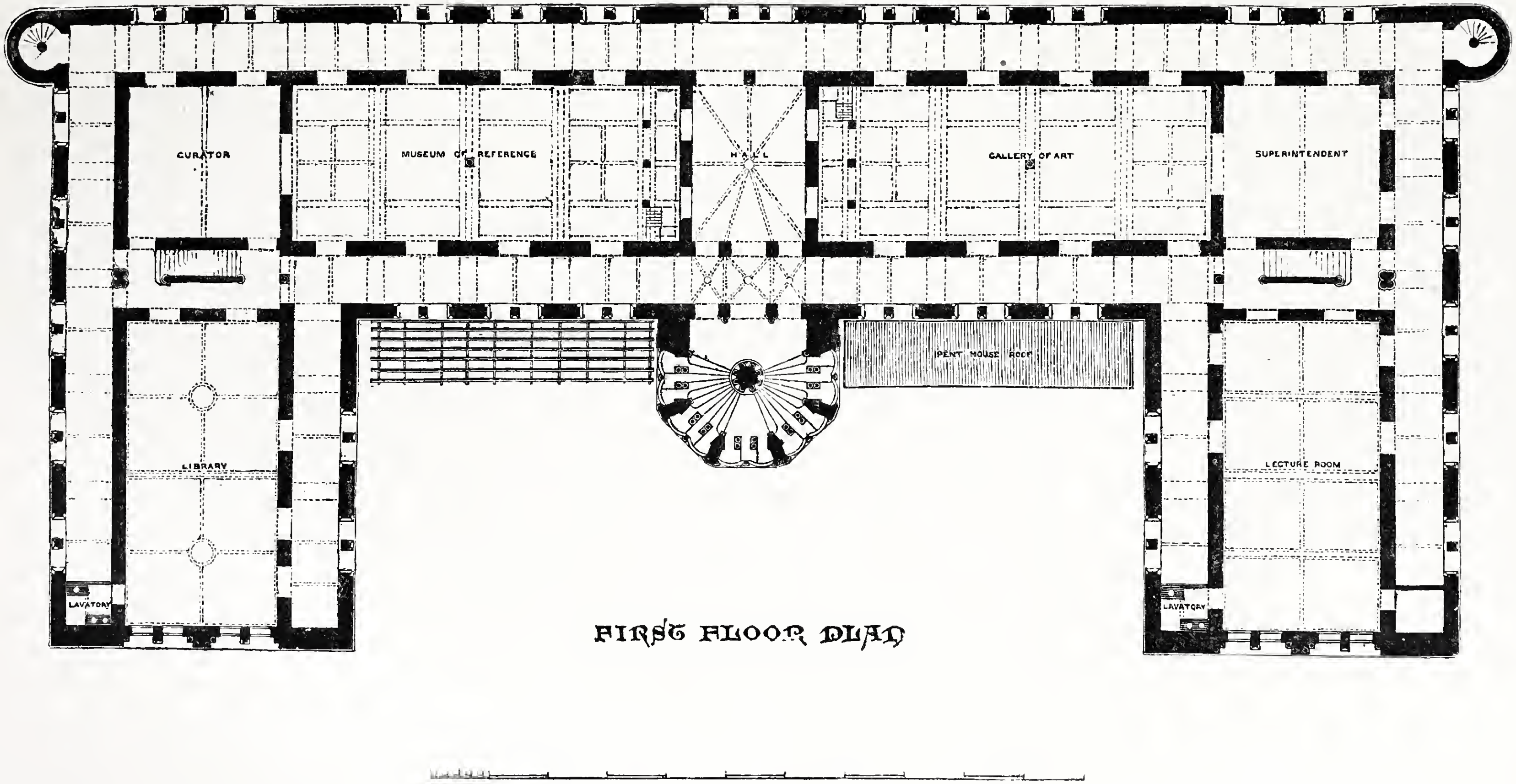


FIRST FLOOR PLAN

PROPOSED SCHOOL OF ART AT BOMBAY.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, December 16, 1867.

By W. Burges, Fellow.

Charles Barry, V.P., in the Chair.

About the middle of the year 1865 I received a letter from the Secretary of the Bombay School of Art, requesting me to prepare a design for a building capable of accommodating that institution and its staff of professors. Enclosed was a series of very able and complete memoranda, written by Mr. Terry, the Acting Superintendent, minutely stating the accommodation required for the various departments. At the same time I was informed that these memoranda were simply to assist, and by no means to fetter me, in the use of my discretion. However, upon investigation, I found Mr. Terry's scheme so very much to the point, and so admirably adapted to the climate, that I could hardly do better than carry it out, with such slight modifications, as my experience dictated. At the same time I thought it only right to make an examination of the Schools at South Kensington, but I found that both the building in question and its mode of lighting were utterly unsuited to a tropical climate. Upon the latter point I naturally fell back upon the mode of excluding the superfluous light and heat, as practised in the larger public buildings in Italy and in the East; while I should also express my obligations to Mr. Roger Smith, who kindly gave me the benefit of his experiences acquired in Bombay a short time previously.

As regards the choice of a style of architecture, I was careful to select one which, without entailing any difficult stone-cutting, would admit of much or little ornament, and, above all, present those broad masses and strong shadows which go so far to make up the charm of Eastern architecture. The style of the end of the twelfth century appeared to fulfil these conditions better than any other, and to assimilate more with Eastern architecture, while it still retained a well-defined European character. It is true that the climate demanded certain modifications, which have been carefully adopted. Thus, the roof assumes a flat pitch, to suit the native tiles; the eaves project very much, to shade the upper part of the building; all the exterior openings, doors, windows, &c., terminate in flat lintels, so that blinds can easily be suspended, and the sun-light prevented from entering; and where the main walls are not protected by an external corridor, thick perforated slabs of stone have been employed instead of windows. The style adopted is one which also presents the advantage of permitting a large proportion of the ornament, *e. g.*, that upon the strings, labels, and abaci, to be omitted in the present instance, and supplied gradually as funds come in, and as the pupils attain the requisite skill.

The proposed site consists of an irregular quadrangle, measuring about 450 feet from north to south, and 320 feet from east to west, the main road running along the eastern boundary. The plan of the building may briefly be described as consisting of a centre with two projecting wings, and an external staircase in the front; while at the back are sundry workshops, partially connected with the main building. The whole edifice is raised a considerable distance from the ground, in order to obviate the damp of the rainy seasons, and advantage has been taken of this arrangement to form terraces all round. The rest of the ground is to be devoted to botanical gardens for the use of the students. A continuous pent roof runs above the principal entrances, projecting sufficiently to protect carriages that might have to remain any time, from the effects of the sun.

Some of the modifications of the architecture demanded by the peculiarities of the climate have already been stated, but there are one or two others which demand some attention. Thus, all openings are reduced to their smallest dimensions, in order to exclude the light. By means of the system of external corridors none of the rooms, except those at the ends of the wings, receive direct light. Whereever it has been possible, the doors of the various rooms have been placed opposite one another, to secure a thorough draught of air, except on the south side. There is a space in the roof above the top story, which space is ventilated from the eaves by large openings on either side. It will be observed that the Eastern tradition of an unbroken roof has been preserved, the requisite variety in the sky line being obtained by the domical roofs of the turrets and great staircase.

The ground plan affords the following accommodation:—In the centre is the hall, which connects the front and back corridors. The porter's lodge is situated under the great staircase, and on the right of the hall is placed the general office. The rest of this floor is occupied by rooms for the accommodation of the various art industries, such as silver workers, stone and wood carvers, lithographers, and wood and copper engravers. These all communicate with the front corridor, so as to be easy of access to visitors. On the contrary, the press-room and the room devoted to glass painting are placed in the rear. The more dirty industries of modelling and casting in plaster, form a communication between the main building and the smithy, the latter being a circular-domed building somewhat in the shape of the Mediæval kitchens; it is divided into three unequal parts, one of which is the smithy proper, and the others are appropriated to kilns for fireing glass, burning terra cotta, or making plaster of Paris.

For the sake of coolness and for the prevention of sound, the ground story is proposed to be vaulted throughout. Access is procured to the other floors by means of five staircases; viz., one large external staircase in the middle of the main building for the use of visitors, two inside lateral ones for the students, and two angle-winding ones for the servants. The great external staircase has been designed upon the model of the celebrated specimen in the Château at Blois, which presents the same system of external balconies. Above the third story it developes into a tower, and finishes with a dome, for which there is ample authority in the Churches in Perigueux, Angoulème, &c. This feature would also harmonize with Eastern scenery and with the surrounding buildings far better than a spire.

By two revolutions this staircase leads up to the central hall of the first floor; right and left of which are the two museums, viz., that of reference for manufactures, and that of art for statues, pictures, &c. Their dimensions are 65 by 26 feet, but they could easily be enlarged by taking in the curator's rooms at either end; by these means two large rooms would be obtained each 91 feet long; in this case it would not be difficult to find places elsewhere for the superintendent and curator.

The wings are occupied by the library and lecture room. The former demands no particular notice beyond the fact, that the southern aspect being a very unfavourable one in a sanatory point of view, that wall would be occupied with bookcases instead of being pierced with windows. The library would also be available for those students who might wish to draw the more valuable objects in the museum, such as jewellery, illuminated MSS., &c. As to the lecture room, besides its original destination, it would also make an excellent place wherein to hold exhibitions of drawings, sketches, &c.

The plan of the second floor is equally simple as in the other stories. There is the centre hall; from it open on the right hand the lavatories for the students, and on the left a large store room to contain models, casts, and apparatus not in actual use. The rest of the plan consists of four large rooms on either side, three of them for students, and the fourth for the masters. This latter is so arranged that it communicates very easily with all the others. It was thought better to devote one large room to the use of two or three masters than to partition off little portions of the class rooms, as the heat of the climate might render the latter arrangement by no means agreeable. The two class rooms in either wing communicate by folding doors, thus rendering them practically one appartment 52 feet long.

The third floor is appropriated to the use of the staff of professors. The painter, sculptor, superintendent and decorator, have each a sitting room, bed room, bath room, and convenience. The sitting rooms are sufficiently large to be used as studios, or in the case of the superintendent, for his more private work. The curator has the same space as the others, only differently divided, inasmuch as he possesses a sitting room down stairs. The water-closets are cleansed from the back corridor, to which additional access is obtained by means of the angle staircases. A kitchen, with a dining and a sitting room, common to all the professors, complete this storey. I have followed Mr. Terry's memoranda in supposing the masters to be unmarried; should the reverse be the case, the rooms are sufficiently large to accommodate a couple. The native servants could be disposed of in the roof, as the accommodation they require is on a far more limited scale than that demanded for the same purpose in Europe.

The statues which ornament various portions of the building would represent:—1stly, the Virtues; 2ndly, the various Arts and Sciences personified; and 3rdly, those men who have most distinguished themselves in their pursuit of the said arts and sciences.

As to the construction, the foundations are to be formed of the common basalt rubble of the country; the same material would be used for the main part of the walls; these latter are to be faced with square ashlar of Coorla stone, in small blocks and straight courses of irregular height. In some instances, the ashlar assumes a lozenge form, with a depression in the surface, as in the tympana; sometimes these lozenges are quite plain, as in the smithy. But, as I understand that this stone cannot be procured in large blocks, I have so arranged the lintels that they could be formed of several pieces, and, in fact, make straight arches. The stairs are also supported on rubble arches, and the same construction is applied in the case of the domes. The latter, however, are covered with small stone tiles, in a similar manner to the side turrets of Notre Dame, at Poitiers. Where large stones are absolutely required, as in the case of the statues, probably the best way of meeting the necessities of the case, would be to import Portland blocks from England.

All the ceilings are to be plastered or boarded, but in every case the joists should be filled up with a light concrete, so as to afford no refuge for insects or reptiles. It is proposed to execute the woodwork throughout the building in teak, which is the best and most durable wood procurable. The floors are roughly boarded, and covered in tiles set in 1½ inch of Portland cement. The doors, in every instance, are made double; the outer ones are glazed and thrown back in summer. The inner doors are to have either Venetian blinds, or turned fret-work, such as may be seen at Cairo. In rainy weather, small moveable glazed frames are applied to the skylights over the doors.

Such is, or rather was, my scheme for a School of Art at Bombay. I say *was*, because the last advices (not official) from India, tell me that there is a report abroad, that my scheme is to follow the fate of so many other schemes, viz., that it is to be put in the hands of the military engineers, who are to perpetrate a copy of the building we all so much admire at South Kensington.

A vote of thanks was passed to Mr. Burges for his interesting paper.

Royal Institute of British Architects.

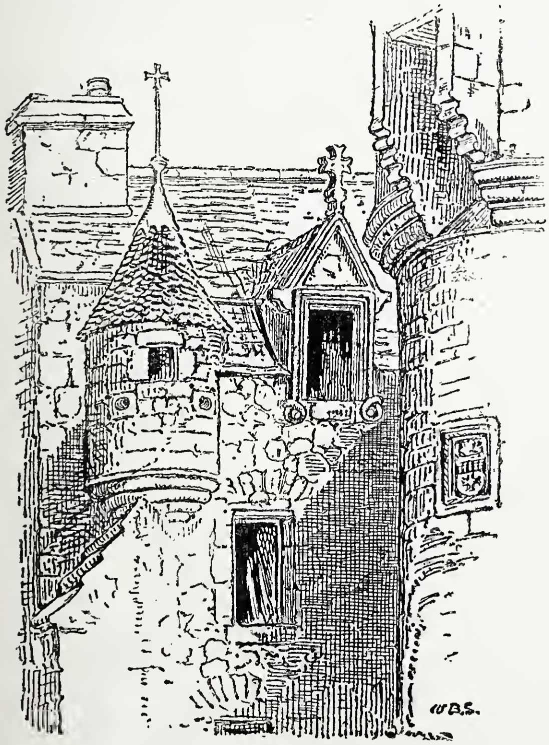
At the Ordinary General Meeting, held on Monday, 6th January, 1868, D. Brandon, Vice-President, in the Chair, the following Papers were read :—

ON MURAL PAINTINGS FOR PENKILL CASTLE, AYRSHIRE,

By W. B. Scott, Esq.

A few weeks ago I exhibited to the members of the Institute a series of paintings—oil paintings on canvas—on which occasion there seemed to be some interest excited in the subject of decorative painting of a pictorial kind. The productions then exhibited were the actual pictures to be applied to the wall; those before you to-night are the cartoons or preliminary working drawings necessarily made when the artist has to paint on the wall itself. The house where this series of pictures is in course of execution is an old peel house or *castle*, as such partially fortified old houses are always called in Scotland, near the coast of Ayrshire. The subject of the pictures is taken from "The King's Quair," or King book, (*cahier*, or *quire* of paper) by the first King James of Scotland; and the method employed is a kind of *tempera*, I cannot call it encaustic, since heat is not applied to fuse the colours into the plaster. The medium used is a solution of wax in turpentine; and the use of this medium has been an experiment, the results of which may be worth five minutes' attention.

A few remarks may be made first, however, on the house itself and on the subject of the designs. The oldest portion of the building is a square tower with massive walls, containing four moderate-sized apartments over each other, the access being by a door and staircase at one angle of the building. The lower apartment, which must have been rather below the outside level, is lighted by five loop-holes or slits, very narrow externally, but splaying out to a convenient size for approach in the interior. The roof of this apartment, which was in fact the stable and cattle shed, at least upon occasions, is arched, the arch being constructed of thin stones like slates, wedged in one upon another with plenty of mortar. The room above was originally, no doubt, floored, simply by compost or paved; it is now however, floored in oak, and there are sundry aumbries, or cupboards, in the thickness of the wall. The whole place having been a few years ago in need of repair, was placed by the late Mr. Spencer Boyd, in whose family it had been an heritance, in the hands of Mr. Thompson, architect, of Glasgow, who constructed in this apartment an elaborate fire-place to give it the character of a hall in a larger edifice. The room above this hall was the bower-chamber. It had originally windows on all the four sides, and may have been divided by a temporary partition or trevesse, the means of obtaining privacy in primitive times.



Right overthwart the chamber there was drawn
A trevesse thin and white, all of pleasance,
The which behind, &c., &c.,

says our poet. In this room there was a garderobe in the mass of wall. The fourth or uppermost room is lighted by two windows rising into the roof, and in two corners are round recesses, the interior of quoin turrets, so general in old French and Scotch houses. These little circular recesses have each three shot-holes, splayed both outwards and inwards, now inhabited every spring by six broods of jackdaws.

In the beginning of the seventeenth century this primitive mansion received an addition, a larger building than the original, being added, I believe, in 1628. The corner staircase being still retained as the means of entrance, the new rooms were entered from the old by means of narrow staircases through the solid wall, the level of the new rooms being about nine feet lower than the old. This narrow staircase did not strike directly through the wall, but descended in the direction of the wall itself, the difference of level requiring a good number of steps.

This interesting old place was left to go to ruin at the end of last century, and when the late Mr. Spencer Boyd repaired and inhabited it a few years ago he had to build an entirely new staircase, more commodious than the old, although of course retaining the newel form proper to the date of the house. It was for the decoration of this circular staircase these cartoons were prepared, and in carrying out the commission I had the good fortune to be allowed to choose my own subject. I selected an early Scottish poem, written by the first James of Scotland when a prisoner at Windsor in 1420, on his love for Jane, the grand-daughter of John of Gaunt. It is a poem in six cantos, in imitation of Chaucer, and is one of the most perfect and beautiful productions of that epoch, although very little known.

My first picture illustrates the first canto, in which the poet describes his rising in the early morning while the bell is ringing for matins. He bewails his luckless fate, having been a prisoner since his boyhood, and consoles himself by reading Boethius, and then calling upon the Nine Muses, he sets about to write some new thing. The materials of the picture, as suggested by the poem, are the matin bell, the warder, the night-watch going home, the young king in his chamber, and other matters suggested, as, for example, the brazen statue of Boethius adorning the wall.

The second picture illustrates the second canto. He looks from his prison window, and sees, as he believes, the fairest of womenkind listening to the singing of the birds in the terraced prison garden. She has with her two maids and a little dog. This picture needs no lengthy description; I will only observe that as mythological persons are largely introduced in the poem, I have made master Cupid, Dan Cupid as Chaucer calls him, shooting the king from behind the hedge.

In the third picture our poet falls into a dream. He is carried away to the Court of Love to get the assistance of Queen Venus. Master Cupid comes down to him from the starry sphere while he sleeps, and carries him away. Here the first flight of the stair is terminated by the landing of the hall or dining room.

The fourth picture, which begins the second flight of stairs, is the most elaborate of the series. At the Court of Love the poet finds all the lovers recorded in history, and sees Queen Venus reclining on a couch. James on his knees prays her aid; but she sends him to the Court of Wisdom to get the assistance and advice of Dame Minerva. A window (and there are many little latticed windows in the staircase) intervening here, I have surmounted it by a figure of Cupid, and in the case of the next similar window by the three Fates weaving his destiny.

The fifth picture shows the lover begging the aid and advice of Dame Minerva. Some portion of

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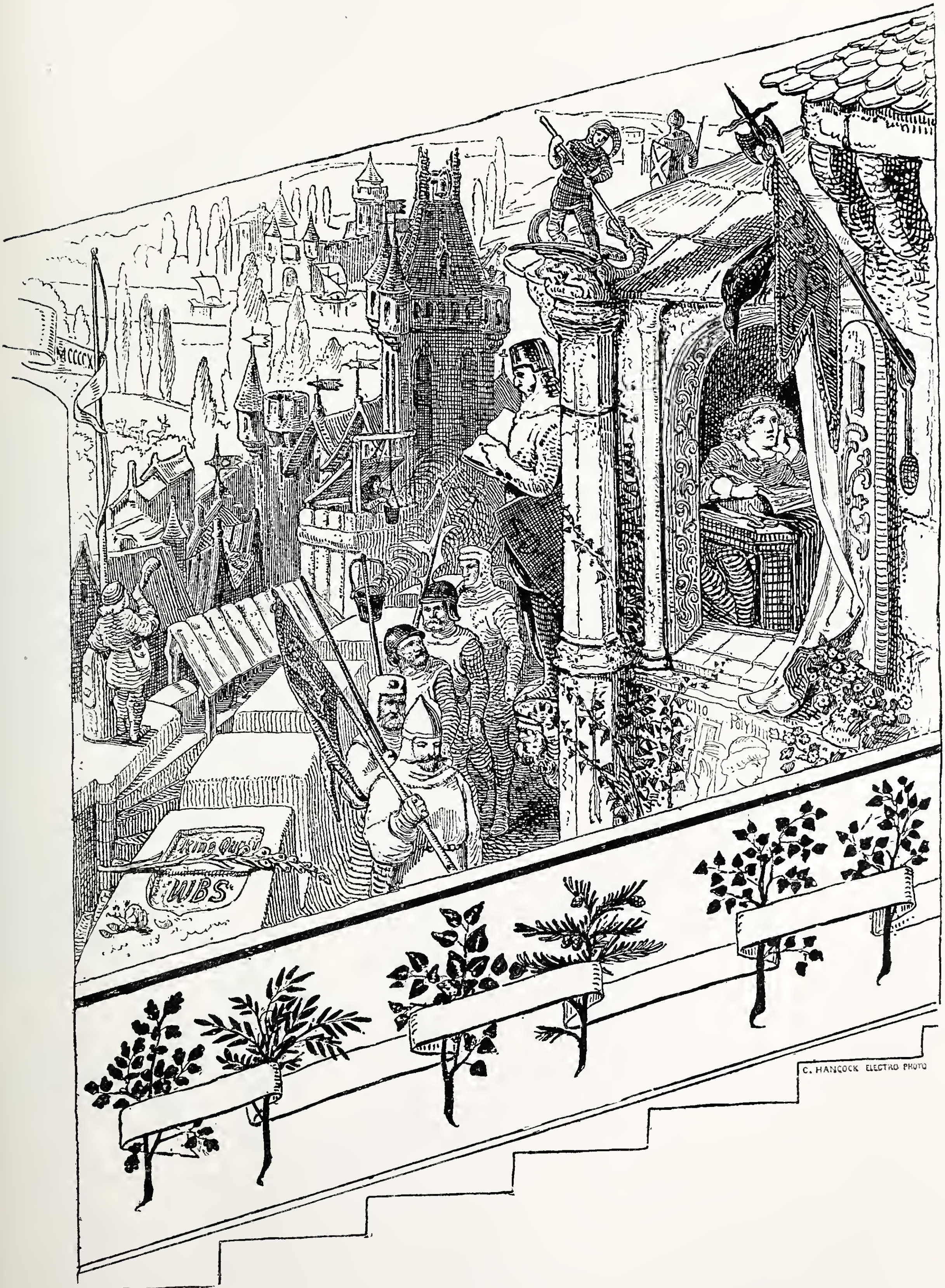

C. HANCOCK ELECTRO PHOTO

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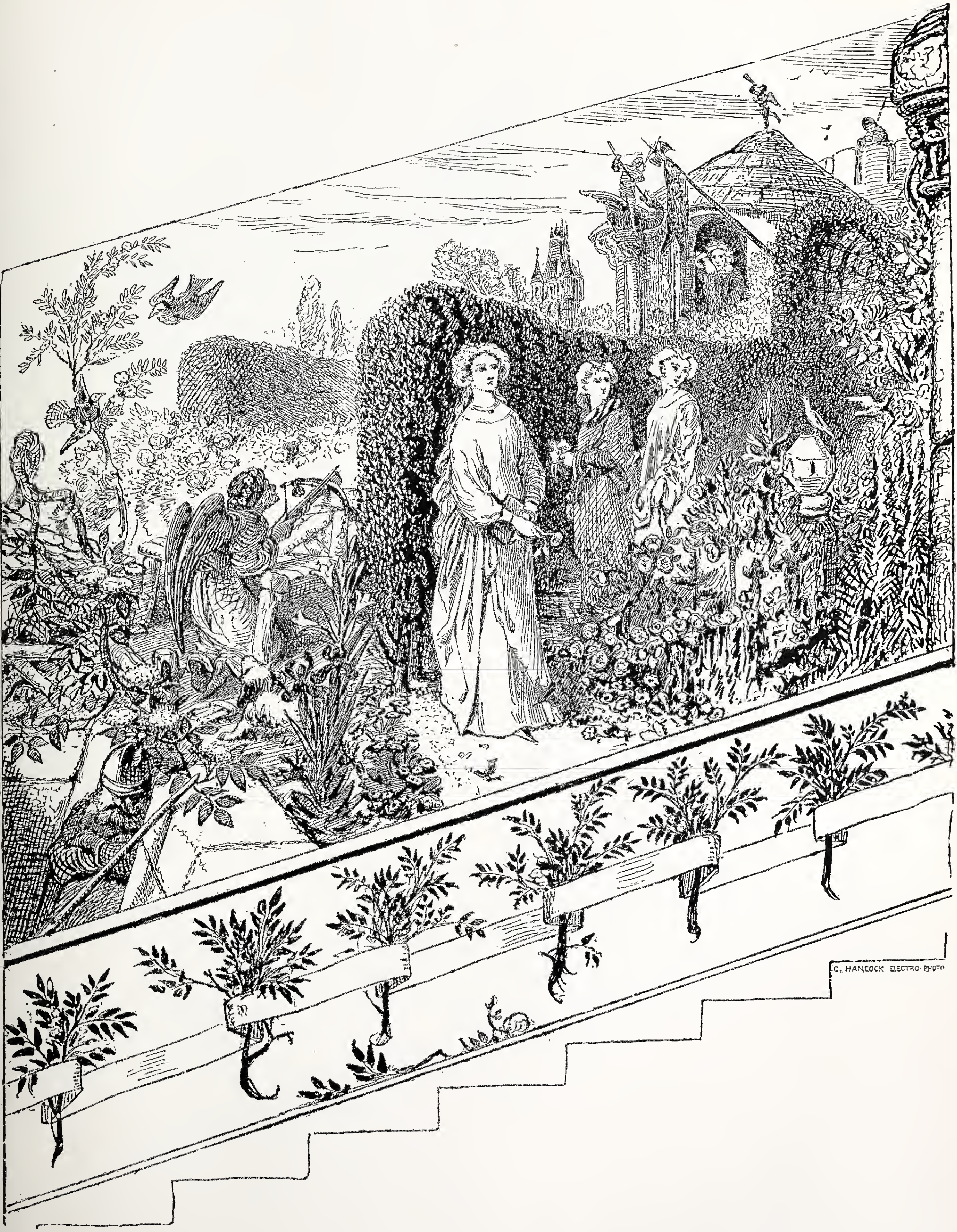

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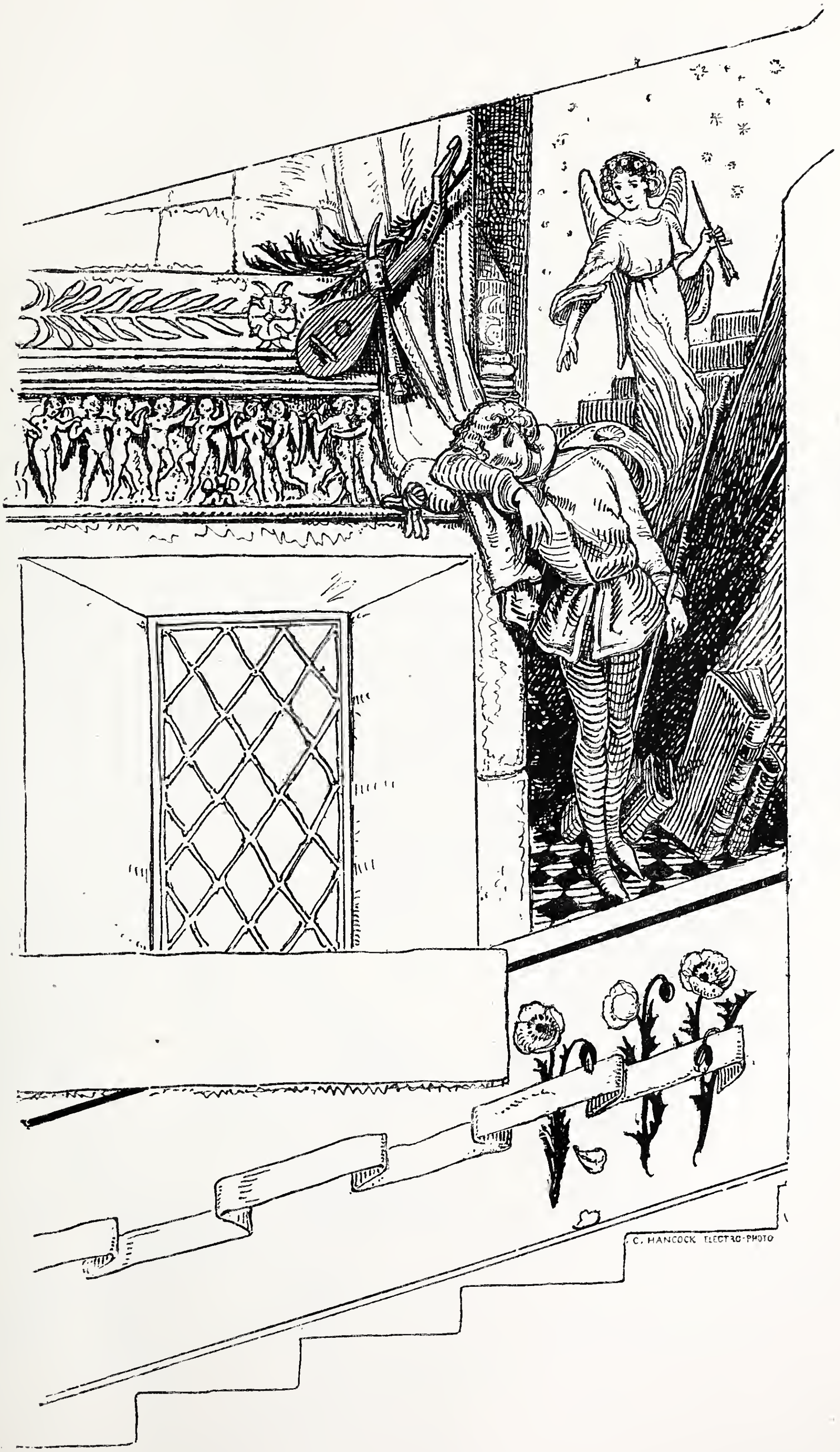

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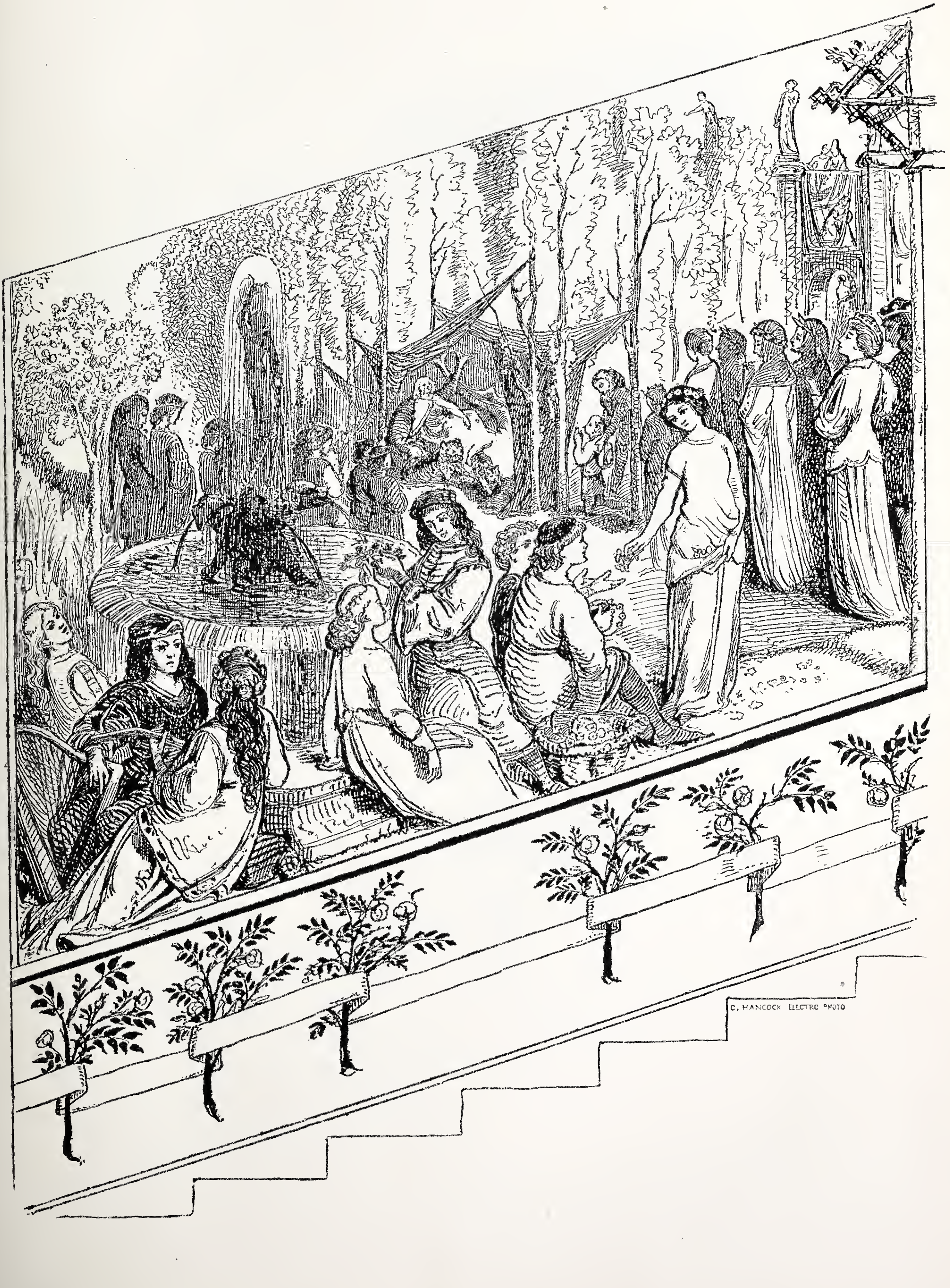
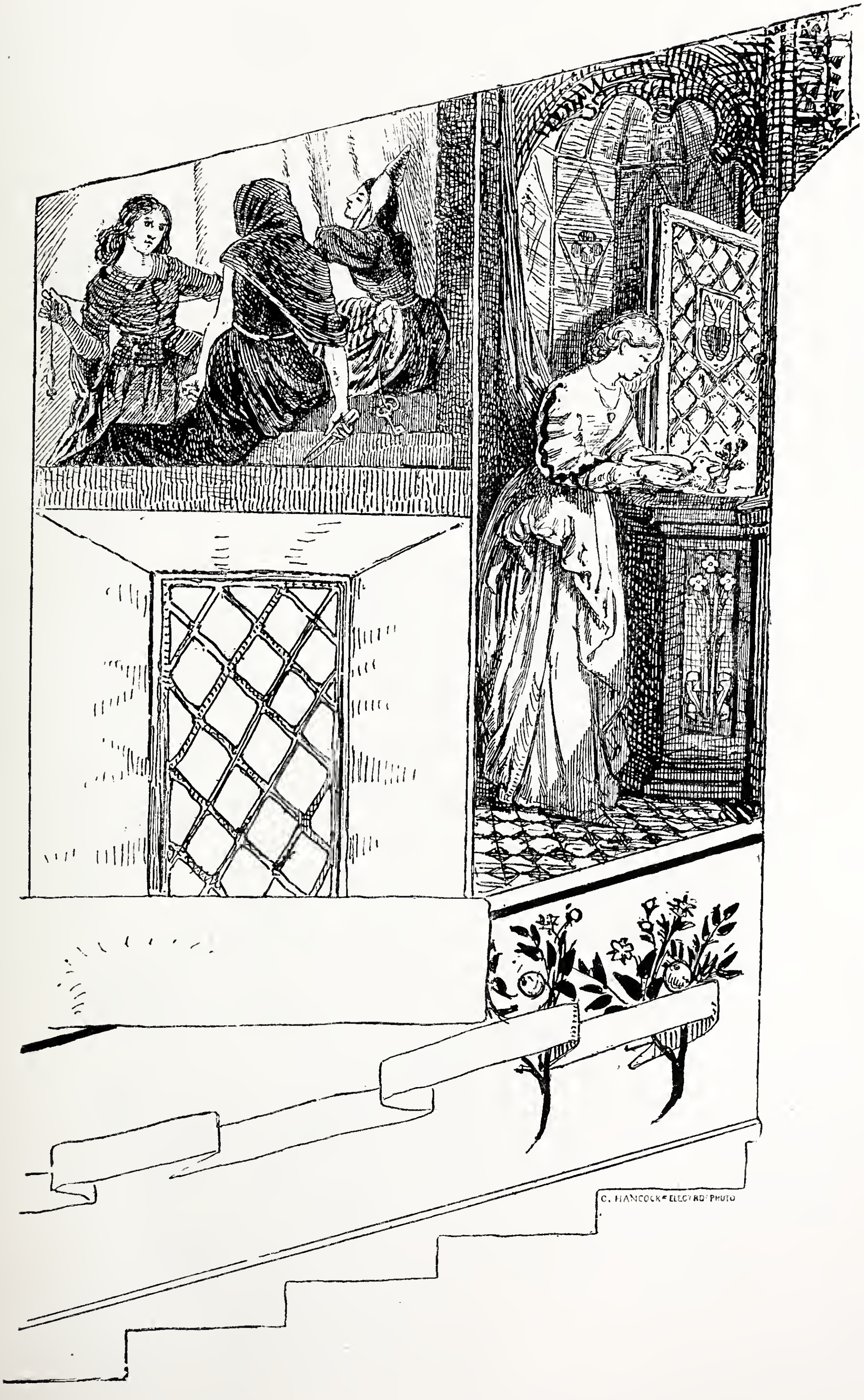


VI.



C. HANCOCK & ELECT. RD. PHOTO

VII.

here ends
the Story
of K·Iames
& th Ladye
Iane
C. HANCOCK ELECTRO-PHOTO

this part of the series yet remains to be done, so it is only necessary to go on to the two last of the series, which occupy the space on either side of the landing of the second floor, now the drawing room. In the one the Lady Jane sends off the carrier pigeon, and in the other James receives it, as an earnest of success in his suit: this being the end of the story.

The first and second of these pictures were painted in the summer of 1865, the medium used being, as before-said, wax dissolved in turpentine, a medium frequently used in Italy for the common decoration of which one sees so much, and adopted by Mr. Parris, I understand, in going over the pictures in the cupola of St. Paul's. This medium I had tried on one of the figures of artists for the Museum at South Kensington, and as I was expressly required at Penkill to paint on the wall itself, I determined to try it on a larger scale. The effect was all that could be wished. When employed on a surface of plaster not previously touched, the turpentine is absorbed with a portion of the colour and the oil in which the colours were originally ground, while the wax retains a great amount of luminosity in the tints with the uniform dull surface, absolutely necessary in wall painting. The unity of surface, characteristic of fresco and of the simplest tempera painting, is attained with greater brightness in the colours. The pigments used are not restricted to *earths* as in fresco, but embrace nearly all the wide range now furnished by the colourmen, without any perceptible chemical change resulting, the medium employed penetrating the plaster sufficiently to protect the colouring matter on the surface from contact with the lime.

But having said this much, I must confess that that part of the wall which is exposed to the south wind, the wet wind in that locality, has in the course of these two severe winters and wet springs shewn symptoms of decay. The great enemy of painting in this country is damp, and it appears that no external wall, without stoothing or other ventilation, is a safe surface for the artist. Whether the wall in question has never been allowed to become dry during the four years, from its construction to the time of my commencing operations, by the beating of the rains for nearly seven months out of the twelve, or whether the wet soaks through from without, in spite of the Portland cement with which it was pointed from the first, is a question no one seems able to solve. The remaining portion of this exposed south side has been lined with sheets of zinc, on which my future pictures will be painted, with what result has yet to be seen.

Having said what seems immediately necessary on the subject of these pictures, may I be allowed to say a few words in reference to the remarks made by some gentlemen last time I had the honour to appear here? Those remarks related to fresco, urging the superiority and desirability of that method, and I am afraid that my assertion that it never would be practised again in this country, or perhaps any where else, might have been construed as an effort at self-defence; the works I then submitted to the inspection of the members being rather easel pictures than wall decorations, having comparatively little of the simplicity induced by tempera painting and necessitated by fresco. However, such was not the case. My opinion was a deliberate one, the result of many years' consideration. I do not mean that we shall never see little pieces of fresco on lath and plaster frames, as we may see books illuminated by hand or imitations of ancient enamels; perhaps we may even see fresco on a small scale applied to some purpose by some one who persists in conjuring by this old form of incantation, and if his artist abstains from all colours but those composed of earths, if he has ten years to prepare his lime, if his wall is thoroughly protected and ventilated, if the plasterer and his wooden trowels and hods are all perfect, if the weather is every day favourable, and if the artist has had a life time of practice, perhaps once more we may have a good result; but this is certain, it has had a revival of twenty years in England and forty in Germany, and all the best artists in both countries who have practised it, Kaulbach in Germany and Maclise in England, have gladly resigned it for the newly invented *silica* medium.

In Italy itself the reign of fresco was little more than a century in length. All the earlier works remaining are tempera. Not many years ago it was not unusual to hear people talk of all early Italian wall paintings as fresco, but it is quite certain no such thing exists; the earlier frescoes, such as Mantegna's works in the Eremitani chapel, in Milan, are miserable ruins, while the tempera pictures of Giotto, a century and a half older, in the Arena chapel in Padua, for example, remain perfect. How then did it come about, that fresco, which died out in Italy very shortly after Michael Angelo finished the Capella Sistina, had a revival in this nineteenth century in Munich and in London? A very short narrative of the circumstances attending this revival will, I think, be enough. The associated body of young German students assembled in Rome at the beginning of this century, aspired to better things than they found existing in the lifeless art about them. They reverted to the study of earlier art, to the actual reproduction of former art. They were also pietists, at least the two leaders, Overbeck and Cornelius; they found their patron saint, Fra Angelico, painted in fresco; they found, also, that all the mythological anti-religious pictures of the Bolognese school and later period were in oil; they determined on the revival of fresco. King Ludwig seconded them, and furnished an ample field for their success. The misfortune was, they did not go back far enough; they were self-denying men, and even the hardships and difficulties of fresco had attractions for them. It was like a revival of Tudor in mistake for a revival of the best period of Pointed architecture. Several English artists living in Rome after the great success of the first very able works of these revivalists, my brother, David Scott of Edinburgh and William Dyce, for example, were smitten with the same feeling. And when the Commission was constituted to consider the application of painting to the new Houses of Parliament in 1841, Cornelius was called over in November of that year; and Prince Albert, who was at the head of the Commission, seconded the views of the austere artist his compatriot, and fresco was determined upon. Tempera and the early works were scarcely ever alluded to, and while the Munich frescoes, all the open-air ones at all events, were already beginning to peel off, English artists who had never painted anything but *genre* pictures in oil, produced those examples now going to pieces in the so-called Poet's hall. Fortunately the silica process was shortly after discovered, so that Maclise, the greatest of English historical painters, and one of the greatest of European artists, has been freed in painting his two great works, the Field of Waterloo and the Death of Nelson, from a waste of energy and from the danger of their premature decay; but the last years of Mr. Dyce were embittered by the difficulties, delays and re-paintings involved in this primitive process, fitted only for a dry climate, and for a summer of continuous equable temperature. The series of designs he expected to accomplish in three years or four, were not nearly done in ten; and that learned, if not really great artist, was distracted by complaints in the houses of Parliament against his industry as well as ability to perform what he had undertaken.

The CHAIRMAN having invited discussion on the Paper just read, Mr. Scott, in answer to enquiries made by several members present, added that the wall on which his paintings were to be executed was of stone, and about 3½ feet thick, plastered internally; and that the surface on which he painted was one of plaster of Paris and lime, mixed. The wall was faced externally with sandstone and pointed with cement.

Professor DONALDSON, Hon. Sec. For. Corr.—I beg to propose a vote of thanks to our kind friend, who has given us a description of the work he has in hand. Reference having been made to the name of Cornelius and other German artists, I may mention, in passing, that I had the pleasure of making their acquaintance when I was in Rome about forty-five years ago, and of seeing the beautiful works of those enterprising young students.* The question of the process by which this class of paintings should be carried out is a very difficult one. I was at Munich about six years since, and I perceived that some of the frescoes there in the Gardens were perishing on the walls to a great degree. We all know how unsuccessful we have been ourselves in our own Houses of Parliament. Previous to those works being begun, the late Sir Charles Eastlake was referred to, and he made some elaborate inquiries and curious researches as to the system to be followed, and he obtained information from those countries in which mural painting has been most practised; but, as we all know, the result has not been fortunate; and even those frescoes, which have been carried out, have been obliged to be retouched to restore them to a state in which the value of them as pictures can be appreciated. The true reason of this failure, I believe, chemical analysis has not yet fully ascertained. It is quite true that artists have been endeavouring to conquer the difficulty, but they have always been frustrated in their endeavours. Even the new water-glass process, as it is called, which has been adopted in the pictures in the Great Hall of the Houses of Parliament, I am afraid is not likely to prove entirely successful. There is a damp, which comes over the surface, which may not chemically affect the picture, yet it is prejudicial to the just appreciation of the work, and deprives it of that beauty of effect which should be derived from the process followed. It is, therefore, very delightful to see that our friend has adopted a system, which he thinks is calculated to be successful in this country. Our climate is peculiar. Dampness prevails to such an extent as to corrode all substances—even stones and limes: and when we further regard the smoke of towns, that is another element of destruction, which it is almost impossible to resist. We ought, therefore, the more to appreciate the spirit of inquiry and enterprise with which Mr. Scott has been animated in adopting a process in the work on which he is now engaged, because he believes it will be successful in counteracting these unhappy influences.

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* In the house of the then Prussian Consul, at the end of the Via Gregoriana, on the Pincian Hill.

Mr. SCOTT.—I think the effect mentioned by Professor Donaldson as having come upon the surface of the water-glass pictures in the Houses of Parliament is the result of mere accident. Before commencing this work I had some conversation with Mr. Maclise about them. He said he was in such a hurry to see the effect of the silica, that instead of using the large syringe, which is proper for the purpose, and which makes the most of the silica, he took a great flat brush, and did it with that over nearly one-half of the surface of the picture, and it is that half which has the whitish bloom upon it which was referred to by Professor Donaldson. Mr. Maclise, however, felt certain it was the result of putting on too much silica, and he believed it could be removed without damage to the picture.

Professor KERR, Fellow.—We cannot but consider Mr. Scott's paintings extremely interesting and valuable in their character, and of great merit in their execution. The idea which that gentleman appears to lay before us is this:—The walls of an apartment (in this case it is a staircase) may appropriately be decorated with paintings; and he asks us to consider the principle on which he, the artist, has proceeded, and whether we, as architects, have anything to say in the way of advice—we could scarcely venture to say criticism—as to the treatment of this practice, which Mr. Scott may be said almost to have made his own. On a former occasion, when Mr. Scott came before us, I did not say anything, because I did not happen to hear the whole of his communication; but it seemed to me then that Mr. Scott had in one important respect overlooked or deviated from a certain kind of architectural principle, which, by the bye, he has not done in the instance now before us. I thought at the time that the design, as we may say, of a continuous picture, independently of the arcaded forms—in other words, cutting out from a panorama a series of semicircular voids—is a principle which may fairly be held liable to objection by architects, leaving painters to speak for themselves. That system, however, is not carried out here: the artist adopts the principle of panel painting, and I certainly prefer this treatment. But in the present case we at once perceive another question: Mr. Scott has another, and perhaps a novel difficulty to contend with. The difficulty of the arches in the former case was great, and Mr. Scott, whether he may be said to have surmounted it or not, did certainly, in his own way, boldly and decidedly meet it. In this case there is, on the other hand, the difficulty of meeting the raking form of the panels, the sloping line, that is to say, of the subject. Now, Mr. Scott does not do any such thing generally as to make his figures perpendicular to the slope, although once or twice he does show great skill in this way; but it seems questionable to me whether he might not have treated his whole subject a little more formally, in order more entirely to disguise the contrast between the slope of the picture and the necessary horizontality of the landscape. In the case of several of these pictures, it seems to me there is a great deal done to meet this awkward incident frankly, but artistically. The horizontality of the subject is sometimes disguised by the treatment of the perspective, for one thing; the pose of the figures is made a secondary means of effecting the object, and the composition of the whole grouping in other cases forms a third means; but when we come, for instance, to the panel, in which the "lovers of the world meet before the shrine of Venus," it seems to me that the horizontality of the landscape is very much sacrificed, and that the people, in plain language, stand on a slope. While, again, the horizontality of the fountain is manifest, that of the trees seems somewhat lost. On the whole, it seems as if the subject, taken as an entire work of grouping, were sloping up-hill, or perhaps sliding down-hill. Again, where the King is kneeling before Minerva, the horizontality does not interfere with the raking character of the picture, because the one is sacrificed to the other. In the first of the series, also, owing to the way in which the composition is put together, the circumstances are, I think, met very successfully. I therefore have to congratulate Mr. Scott, from my particular point of view, in having been more successful in meeting the difficulties in this case than I consider him to have been in the former case. With regard to the style of painting, Mr. Scott is, of course, eclectic, after the prevailing fashion of our time. Formerly he was painting for an Italian Hall; here he is working for a Gothic staircase; and if I do not happen to admire the Mediæval style of landscape painting, that is no reason why Mr. Scott should not do his best in that style. I am sure we all hope that his efforts may prove as successful as he anticipates. The practical question of damp is one which we ought not to allow to pass without a little more discussion, and an offer of our opinions to Mr. Scott. We all know very well that a stone wall, even a granite stone wall, will draw the wet through a thickness of several feet, more particularly where the stones are headers extending a long way through the wall from the outside. It seems to me that the best advice for us to give with regard to all walls on which paintings like these are intended to be placed is this:—First, they may perhaps be treated externally with some of the stone preservative processes. Probably that of Mr. Ransome is the best, in which he uses silicate of soda and chloride of lime, producing a coating of silicate of lime, which is claimed to be impervious to wet. Secondly, if that were not likely to be successful, it might be possible, for the sake of the paintings, to coat the outside of the walls with some material like cement. Thirdly, the internal face of the wall may be cut away to a slight depth, and made up with damp-proof material, such as dubbing out with tiles in cement. Another point before us is the vehicle to be used by the painter. I am not able to pass any opinion upon the one described by Mr. Scott; but with regard to the water-glass used in the great pictures in the Houses of Parliament, I think we must be allowed to doubt whether it will not probably turn out to be a mistake to have used water-glass, because this material, silicate of potash, has a very strong attraction for the moisture of the atmosphere. I believe that is how the moisture which now and then appears upon the surface of the picture is occasioned. Even when this water-glass is treated with chloride of lime, and converted into silicate of lime, there is still a large quantity of common salt thrown off, and until that is got rid of it has a strong tendency to absorb water; and many persons apprehend that these pictures will continue to be absorbent of water to the end. Lastly, as to using plates of zinc, I should strongly advise Mr. Scott to reconsider that idea, for many reasons. It would be better, I think, even to go so far as to take off the whole of the suspected surface of the wall on which the pictures are to be painted, and to replace it with a plaster surface on an impervious backing.

Mr. CHARLES BARRY, V.P.—I would express a hope that illustrations of the pictures exhibited this evening will accompany the publication of the paper in the "Transactions," as was the case on the former occasion, because it will give additional interest to it, and will enable members not present to-night to appreciate the value of the works themselves, as well as the remarks which Professor Kerr and others have made. As far as my recollection goes, the former work of Mr. Scott did not lay itself open to the criticism which has been passed upon it. There are many examples of frescoes by the old masters which are thoroughly open to this criticism, where they have not hesitated to execute subjects, and allow arches or panels to break the composition, leaving the imagination to fill up the continuity of the subject they broke into. My remembrance of the paintings which Mr. Scott placed before us on the former occasion leads me to think the treatment of them was not open to the criticism which has been made. They were continuous pictures of a continuous subject; they were executed also in differently-shaped panels and spandrels; but I do not remember that they were broken by the intervening arches. For my own part, I admired them from this very great difficulty having been so successfully got over. I think Mr. Scott has been equally successful in the treatment of the pictures exhibited to-night. The one subject of the Lovers' scene is, perhaps, to some extent open to the criticism made; but I am sure Mr. Scott will accept the remarks which are passed here in the friendly spirit in which they are offered. I hope, however, he will have some means of protecting the inside surface of the wall without robbing the external wall of its stone character, and not sacrifice the ancient glory of the exterior by coating it over with a foreign material. There are two or three ways of meeting the difficulty; but the most obvious is, when you are afraid, from the porosity of the material with which the walls are built, that the moisture will go through them, to construct a separate inner wall, which is not a difficult thing to do, and quite worth while when the walls are to be covered with works of art. Between the inner and outer there should be interstices of space, which would, I think, in most cases get over the difficulty. I quite agree with Professor Kerr of the warning he has given with regard to the zinc, and probably Mr. Scott will come to the same conclusion.

Mr. WILLIAM WHITE, Fellow.—With reference to the treatment of the subject in an architectural picture I think great care should be taken not to cut off any portion of the figure. I think that ought to be one of the first elements of architectural treatment in mural painting, as also in stained-glass subjects, as in the old days. They brought the figure in front, and even over the border, where it was a little too long. It may be a question whether in the case of this representation of clouds they can be considered as part of a strictly architectural painting. They did not come in until a late period of this kind of painting, and rather in its decadence than in its advanced state. With regard to the material used by Mr. Scott, and the mode of application, I understood it to be a sort of tempera. I have seen a good many instances of a process used by Mr. Gambier Parry, which many here would be acquainted with. I do not know of an instance where it has failed. The colours have stood well, and the material goes on hardening, so that, after the picture has been done two years, it may be scrubbed with soap and water without damage, and the moisture will not touch it.

Mr. CHARLES FOWLER, Fellow.—To properly appreciate decorative paintings of this kind, they should be seen in place. A judgment formed only from the cartoons may be open to great error. I should wish to ask Mr. Scott to be good enough to inform us as to the lighting of these pictures. In the first place, what is the width of stairs? and whether they go round a solid newel? and what would be the distance from which these pictures would be seen? and whether the general effect will be seen from the well-hole? With regard to the lighting, that appears to be effected chiefly through narrow windows in the wall; and that is a point which may affect the treatment of the pictures, and which Mr. Scott has had in his mind, but which we cannot appreciate. Therefore Mr. Scott may have made one picture lighter than the others because it comes in a dark place, and have put in more colour in situations where it would be best displayed. If Mr. Scott will kindly supplement this information, I think it will tend to complete his communication.

Mr. SCOTT.—I quite felt the difficulty, before I brought these sketches down here, of making the meeting apprehend what the pictures would look like on the wall. It is a different thing to see a flat surface like this, and to ascend the staircases, surrounded by a curved surface of paintings on the wall, with windows at intervals opposite to each other. The staircase is circular, and is about eleven feet wide; that is to say, the entire diameter of the opening. It is solid in the centre, and commonly called a *turnpike* stair. The great difficulty I had to contend with was that there should be no perspective to catch the eye. I had to carry the back-ground of the picture quite out of sight. You could not find out where the horizon was. If you raise this picture to meet that line (pointing to the first and second cartoons), you will find that the horizon of the first is the same as that of the second, which is much higher on the staircase, although both are visible from one point of view. I think it is stated in the paper read that the staircase is circular, and these pictures go slanting all the way up. The question with regard to the condition of the wall on which the painting is done is, of course, a very important one, and I shall be much indebted to any member of the Institute who will be kind enough to throw any light upon it, so as to obviate the damp of the wall. In the first instance I expressed a wish to have something done with the exterior wall, but the present owner (Miss Boyd) would not hear of it for a moment; and the only plan I could fall upon was to have plates of zinc tightly fastened over the surface of the wall, which corresponds with the damp part lower down in staircase, and at present there is no appearance of the paint peeling off.

Mr. WYATT PAPWORTH, Fellow.—As this question of damp in walls is a most important matter, it would be interesting to hear the experience of gentlemen present. Only a fortnight since a professional friend applied to me to advise him as to the best method of keeping moisture from penetrating the brickwork of a dwelling erected in an exposed locality. I was obliged to reply that I did not know of any effectual remedy except that of building up a thin wall in front of the present one, and leaving a small hollow space between the old and new works. As to preventing damp from showing on the *inside* of a wall, no doubt the most effectual remedy is—as Professor Kerr remarked—that of hacking off some inches of the stonework or brickwork, and building up inside a hollow wall with tiles or other material. I do not know a safer mode of effecting a remedy. There are two points of importance—first, preventing moisture from soaking through a wall; and, secondly, the curing of already damp walls.

Mr. CHARLES FOWLER.—People are misled sometimes with regard to the damp in walls, or rather on walls. I had one instance of that last winter. The house of a friend of mine having been vacant for some time, the staircase was repapered and varnished, and at the time he was thinking of inhabiting it, the place was found to be streaming with water down the walls. He supposed the wet came through the wall; but that could not have been the case, as the staircase was next to a party-wall. It was simply a condensation of the moisture in the atmosphere, owing to a sudden change of temperature. My own experience is, that, whenever you have a non-absorbent surface, that will occur in our changeable climate; and if Mr. Scott adopts zinc plates, unless he guards against sudden changes of temperature, I think he will find his paint will peel off from that cause. The water streams down to a degree that people who have not noticed it are not aware of, and I would caution Mr. Scott on that point.

Mr. WHITE.—In conversation on painting, I have been informed by decorators that zinc is a material which will stand very well indeed, if the method is adopted of scrubbing the zinc thoroughly, and gilding or silvering it over before touching it with the paint. That, I have been told, will adhere in a way that paint will not, and it certainly makes a fine surface for painting upon. Another method is, to let the plate be well scrubbed, and to use zinc paint instead of lead and oil (which creates galvanic action with the zinc, and in time will wear off), you have a greater guarantee for the preservation of the surface of the paint. In some parts of the country, in stone-wall localities, people build two walls, as it were, carefully packing the middle with dry stone, and so any wet that goes through the outer wall drops down, and the inner wall remains dry. In the case of a circular staircase, this result might, I think, be effected by first placing a tile without cement lodged against the wall, and a second tile well cemented against it, and that would leave a sufficient space for air and the prevention of moisture, and would obviate the condensation of moisture on the inner wall, which might otherwise take place.

Mr. COLLMANN.—It is seldom that an artist can choose the wall on which he has to paint. I have often been consulted as to the mode of guarding against damp in walls. The only practical precaution on a finished plastered wall is, I think, to use a proportion of resin, red lead, and turpentine on the surface. As to the plates of metal, I believe they will not be found to answer. To guard effectually against damps, there is nothing but—as Mr. Barry says—to provide an inner wall surface. With respect to the silica process, the damp upon the pictures arises principally from condensation, like the effect on a varnished wall. I am sorry I am not able to suggest any other practical remedy.

Mr. CHARLES BARRY.—We all, more or less, endeavour to be chemists, and I cannot allow the remark just made, implying that there would be any advantage in coating the zinc with gold or silver, to pass unnoticed, because I should be sorry it should go forth as a recommendation from this body. Galvanic action is always set up between two metals of different degrees of oxydation, and the greater the disproportion of oxydation the greater will be the amount of galvanic action. A plate of zinc silvered will produce more galvanic action than lead and zinc in contact together, the former metals having a greater difference of oxydation than the latter.

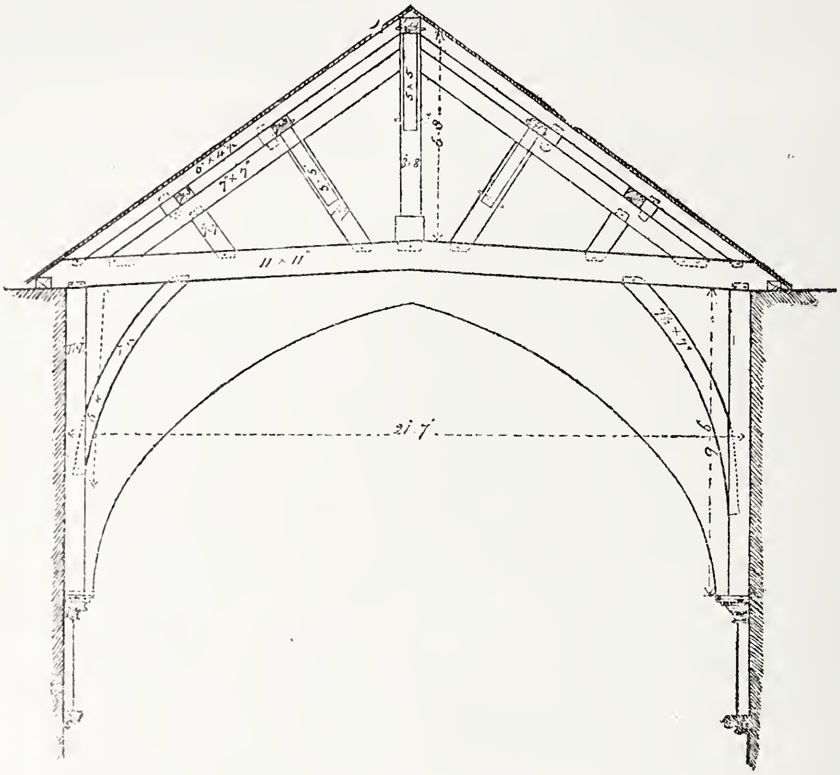
The discussion having thus concluded, a vote of thanks was passed to Mr. Scott for his interesting Paper.

A DESCRIPTION OF THE OLD ROOF OVER THE NAVE OF WEST CHURCH, STIRLING.

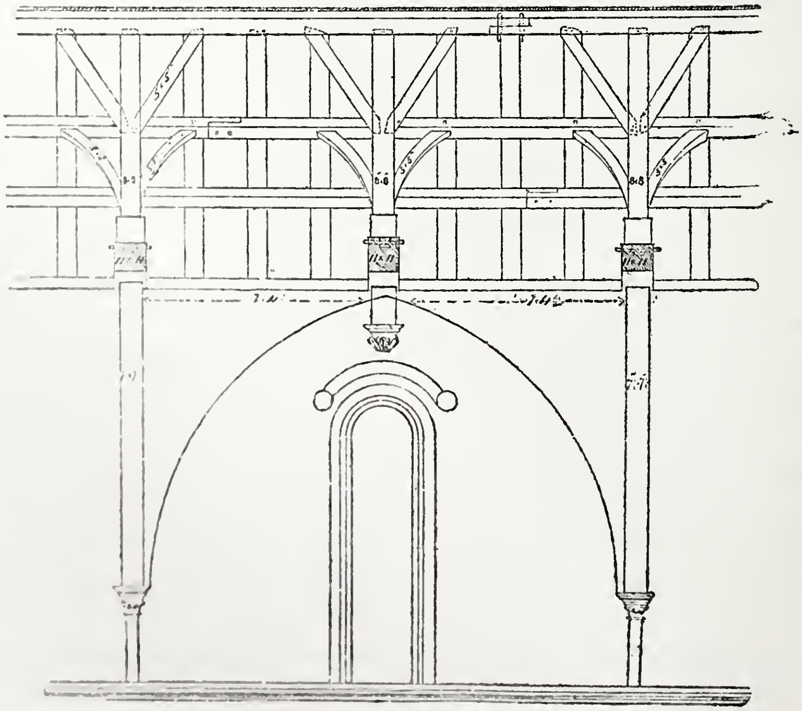
Communicated by J. McLEAN, Esq.

" THE old oak roof on the nave of the West Church, Stirling, is of very rude workmanship, its timbers being merely squared with the axe or the adze, the by-wood left unreduced, and the oak pins used for fixing the parts together being, in the upper portions, left projecting through both sides of the timbers, in the manner I have endeavoured to show on the drawings. My first impression on seeing it was that it had not originally been intended for exposure as an open timber roof; but on investigating the matter I found that the pendant parts rested upon carved stone capitals and corbels, and that the masonry between them was as well executed as that of any part of the interior of the church, also that there was not the slighest traces of a ceiling of any kind ever having been fixed to the walls or tie beams. And it was on considering these and other indications of minor importance that I was led to believe that the roof had been intended for an open timber one, that it was at least as old as the walls upon which it rested (apparently late fourteenth century) and taking into consideration the flatness of its pitch, its peculiar construction and the rudeness of the workmanship, there was a great probability of

ROOF OVER NAVE, WEST CHURCH, STIRLING.



Transverse Section.



Longitudinal Section.

its having belonged to a church of much earlier date, the nave, pillars and responds of which suppor the clerestory of the present building. These pillars are circular on plan, 4 ft. in diameter, and have bases and capitals belonging to the transition Norman style of architecture.

There are other circumstances which may have had something to do with the great strength and flatness of the old roof, and the chief of these is that of the church being within range of the guns on the castle walls, and consequently liable to damage or destruction by any enemy who might be in possession of the same. This the builders of the church seem to have provided for, by making the walls of great thickness (4 ft.) and putting no windows in that part of the clerestory which faces the castle and the esplanade. The side aisles are vaulted with stone, and are at present covered with modern lean-to slated roofs; but, being of opinion that that was not the way they were roofed originally, I examined the space between the top of the vaulting and said roofs, and there saw corbels projecting from the clerestory wall at about the same level on the top of the aisle walls, and over these corbels is a dripstone course, such as is used for covering in a roof, thus clearly indicating that the roof of the aisles had originally been perfectly flat, and in all probability so constructed for purposes of defence.

Another reason for the strength and flatness of the old roof suggests itself on looking at the roof on the east end of the East Church (a building of much later date), where the covering is composed of large stone flags. It is likely that the other roofs were covered in the same manner at one time, and were altered when they ceased to be water-tight; but this part being vaulted with stone, the admission of a little water would not be attended with the same discomfort, and so the flags would be allowed to remain. This view of the matter is strengthened by the fact that the wall-heads behind the parapets of both the churches are done in this manner instead of with lead. It will be seen that the tower of the West Church has been designed with a view to safety or defence, as it has bartizan parapets on the north and south sides, and an embattled platform on the top. It will be seen that on the east face of the tower there are drip-stones projecting in a line corresponding to the pitch of the roof, which seem to indicate that the roof of the church has been lowered, but on examination there are no traces to be found of the roof ever having been higher than it is at present; and, judging from the appearance of the masonry and the baronial character of its design, I am of opinion that the tower is a work of later date, and that when they were building it they had intended adding height to the clerestory, or perhaps groining the nave at the same time, and so left the drip-stones above referred to.

I do not know that I can say anything more that would throw light on this subject, but I hope that the peculiar construction of the roof, together with the few particulars here given, will be interesting to Members of the Royal Institute of British Architects."

After a short discussion on the subject of this Paper, Professor DONALDSON proceeded to read—

EXTRACTS OF A LETTER FROM ATHENS,

By Signor KAFTANGIOGLU, Architect, Hon. and Cor. Member, dated 26th December, 1867, and addressed to the Hon. Sec. For. Cor.

" I wish to give you some account of Art at Athens, knowing the interest you take in the subject. After the fall of King Otho, art lost a great protector at Athens, and I was myself obliged to resign my appointment as Director of the School of Fine Arts, which is now in the hands of the military engineers. In revenge I was happily charged by the executors of a rich individual to execute my project for a School of the Fine Arts, called Polytechnic, at a cost of £80,000. Four years are passed since it was commenced. The sub-basement, all the columns, the cornices, windows, are of Pentelic marble. The plan of the edifice is divided into three separate blocks; three-fourths are now built, and I hope to cover it in in the course of the year. The elevation has a length of about 330 English feet; in fact, it is the largest building now constructing at Athens. Besides this Polytechnic School we are now erecting a Museum for Antiquities after the plan of a German architect, Professor Lange, of Munich. The expense will be met by a rich Greek at Petersburg M. Tosigon, and a Candiot lady Mme. Bernardachi. The works also of an Academy of Literature and Science will be soon resumed, after having been suspended for some time: it is being built by Hansen, at the expense of the rich Greek banker, Sina, of Vienna. The Archæological Society have decided, with the money raised by means of a lottery, upon laying open the remains of the Temple of Apollo at Delphi, which, as you know, are covered by the houses of the village. But unfortunately the money required, amounting to £8,000, is not sufficient to buy up the village. Neither France nor England have yet taken part in this important matter. In the meantime I send you a leaf of laurel, which I plucked on the spot. The day before yesterday a representation took place in the Odeum of Herodes Atticus, of the *Antigone* of Sophocles. Thus after so many centuries, the Theatre of Herodes Atticus again vibrated with the accents of the universal poetry of Sophocles. The railroad from Athens to Piræus, by an English contractor, is on the point of being commenced. Unfortunately the line chosen for the station is not favourable either for the antiquities nor commercial interests, having been injudiciously selected."

The meeting then adjourned

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 20th January, 1868, JOSEPH CLARKE, Vice-President, in the Chair, the following Paper was read :—

ON THE KREMLIN OF MOSCOW.

By EDWARD I'ANSON, Fellow.

THE subject of the paper I have the honour of reading this evening is that of the Kremlin of Moscow. It affords in itself, as I trust you will find, matter for our consideration to-night, and it contains a sufficiently complete and rich collection of buildings to enable us, I think, to understand Russian architecture before it merged into the prevailing classic school of modern Europe. I shall make a few allusions only, to the architecture which I had the opportunity of seeing in some other parts of the empire, and you will not, I trust, take exception to some detailed observations on the various buildings of this Kremlin, to which I shall have to call your attention.

Moscow, as I approached it by railway, gave no distant evidence of its existence. Launched at once from the railway station on to a muddy plain, I observed no signs of a great town; but Moscow viewed from a distance, as I afterwards saw it from the Sparrow Hills, is really a striking sight. Eugeune Labaume, a Captain of the Royal Engineers who accompanied Napoleon's army in 1812, and wrote a description of the march, says :—

" The staff, about two o'clock, established itself on a lofty hill, whence we perceived a thousand " elegant and gilded steeples, which, glittering in the rays of the sun, appeared at the distance like so " many flaming globes. One of these globes, placed on the summit of a pillar, or an obelisk, had the " exact appearance of a balloon suspended in the air. Transported with delight at this beautiful " spectacle, which was the more gratifying from the remembrance of the melancholy objects which we " had hitherto seen, we could not suppress our joy; but, with one spontaneous movement, we all " exclaimed, 'Moscow!' 'Moscow!' At the sound of this wished-for name the soldiers ran up the " hill in crowds, and each discovered new wonders every instant. One admired a noble château on our " left, the elegant architecture of which displayed more than Eastern magnificence; another directed " his attention towards a palace or a temple, but all were struck with the superb picture which this " immense town afforded. It is situated in the midst of a fertile plain. The Moskwa is seen meandering through the richest meadows; and after having fertilized the neighbouring country, takes its " course through the middle of the town, separating an immense cluster of houses, built of wood, " stone, and bricks, constructed in a style which partakes of the Gothic and modern architecture of " every different nation strangely mingled. The walls variously painted, the domes covered with lead " or slates, or glittering with gold, offered the most pleasing variety, whilst the terraces before the " palaces, the obelisk over the gates, and, above all, the steeples, really presented to our eyes one of " those celebrated cities of Asia, which we had thought had only existed in the creative imagination of " the Arabian poets." And this description by no means exaggerates the imposing view of Moscow as seen from the eminence of the Sparrow Hills, some three or four miles distant from the city. " Hallowed by no Apostolic legends, not even by any Byzantine missions; cleared out of the forests " which down to the fourteenth century overhung, and still leave their names on, the banks of the " Moskwa; with no other attractions than its central situation in the heart of the Russian Empire, it has " acquired a greater hold over the religious mind of a larger part of Christendom than is probably exercised " by any other city except Jerusalem and Rome. It is a very Russian Rome, no doubt, but still, like it, the " city of innumerable churches, of everlasting bells, of endless possessions of palace and church com-

"bined, of tombs and thrones, and relics and treasures, and invasions and deliverances, as far back as its "history extends."

Before I went to Russia I endeavoured to prepare myself for the journey by consulting such books as had been written on the subject. In Clarke's 'Travels,' written in 1810, I found a plan of the Kremlin, and some indifferently executed, but still valuable engravings. I found in Dean Stanley's volume 'On the Eastern Church' a most interesting and instructive history of the Russian Church, written with his accustomed clearness and beauty of style, and there I also found an excellent plan of the most interesting church in Moscow, namely, the Church of the Assumption—the Uspuiski Sobor. I read the short chapter in Fergusson's 'Book on Architecture.' Need I say that I duly perused Murray's 'Guide,' in which I found a copy of Dean Stanley's plan; and I also took the somewhat enthusiastic book of Professor Piazzi Smyth, called 'Three Cities in Russia,' written with an evidently strong and favourable appreciation of all he saw; and as I feel that many of his observations, as well as those of Dean Stanley, are more descriptive than any I could myself offer you, I have in the course of this paper drawn largely from these authors.

Without going into the question of the etymology of the word Kremlin, and which I believe simply means *fortress*, I may here mention that in the chief Russian towns the fortified portions are in all called the Kremlin. Out of the four great Russian towns I visited, viz., St. Petersburg, Moscow, Nishni Novgorod, and Kazan, and of these four, one, namely, St. Petersburg, is hardly a Russian town. Each, except St. Petersburg, had its Kremlin: St. Petersburg really has its analagous quarter, but here it is called the fort. The Kremlin corresponds with the Acropolis of Greek towns, and the Alcaza of Spanish towns: it is the fortified enclosure—the citadel, in which the cathedral church, the palace, and the chief government buildings are placed. The Kremlin of Moscow is the centre of the town; it is the kernel, as it were, of the whole city, and is wrapped round with the other portions of Moscow, and in conjunction with another walled-in portion of the town which immediately adjoins it—the Katai-Gorod—it is the oldest part of the town. The Kremlin is the court or imperial quarter of the town, and the Katai-Gorod the commercial quarter. The Kremlin of Moscow is bounded on the south side by the river Moscowa; it is nearly triangular in form, the base of the triangle next the river being, as measured from the map in Dr. Clarke's 'Russia,' about 2,000 feet. On the north-west side it is bounded by gardens, where formerly there was the fortress ditch, or old valley of Neglinaya; and on the east side it is separated by a wide space—the Krasnaya Ploschad (the Red Place)—from the Katai-Gorod, which slopes rapidly from north to south towards the river. The greatest width on the north-east side is also about 2,000 feet. The total circumference of the walls is 7,280 feet, within which are 32 churches, several public buildings, and 170 chapels, cupolas, and towers. The Kremlin stands some 46 feet or more above the level of the river banks, whilst at the upper or north extremity it is on the same level as the upper part of the declivity of Krasnaya Ploschad adjoining it. The walls are chiefly of brick, as, indeed, are almost all the buildings incorporated with or contained within them. They are embattled like the walls of Verona; the wall space is broken with numerous and very picturesque towers, which will be described more in detail. "It is said that part of the site now "occupied by the Kremlin was enclosed by walls of oak between the year 1339 and 1340. Demetrius "of the Don laid the foundation of stone walls in 1367, which resisted the Tartars on several occasions. "In 1445 the Kremlin was burnt, and the walls and gates partly destroyed. The introduction of "artillery rendered the old walls, although repaired, no longer safe against invaders. John III. invited "Italians to build new fortifications of stone, which were accordingly erected between the years 1485 "and 1495, and subsequently extended and strengthened."† But in 1571 the whole city was burned by

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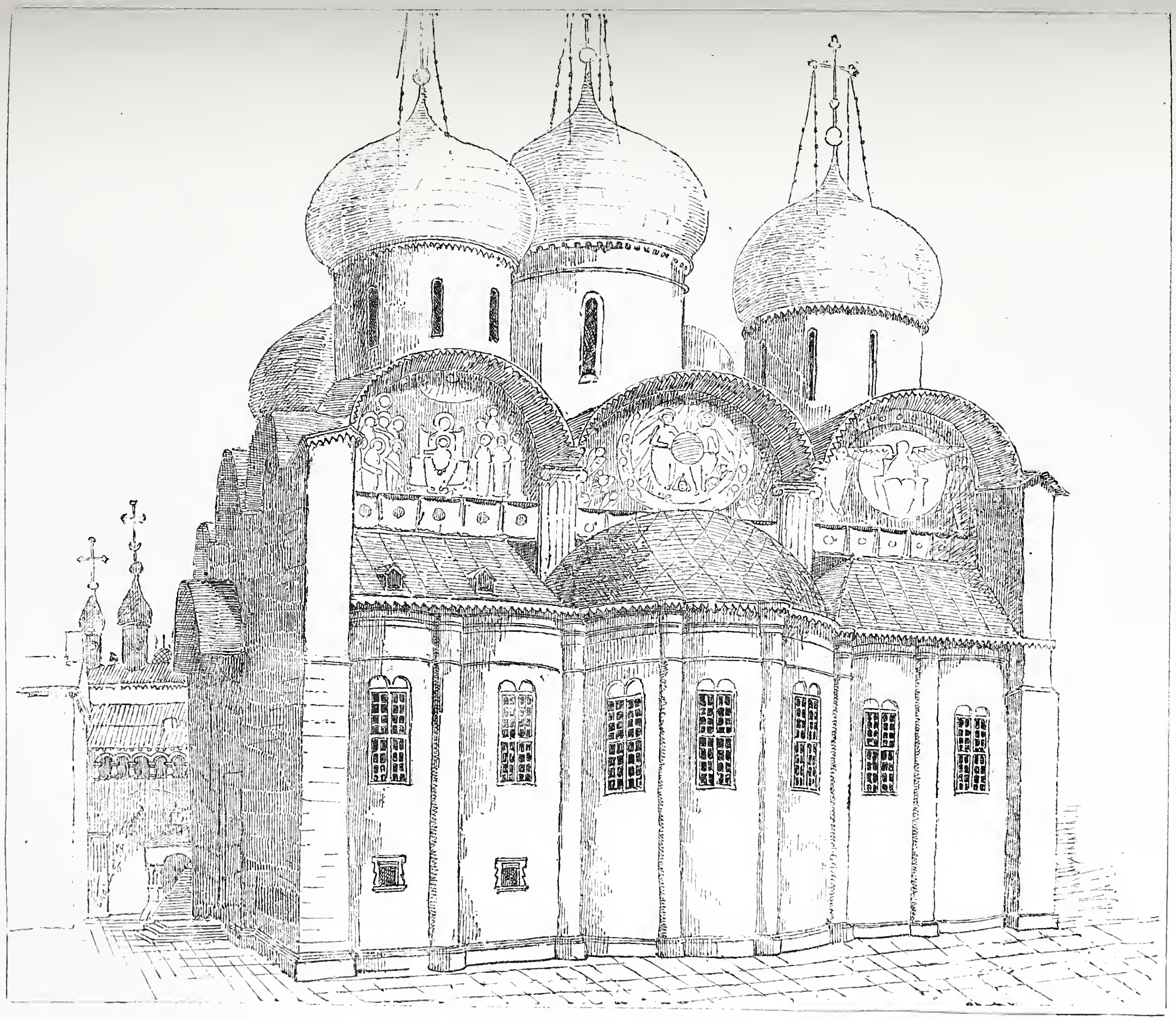
* Stanley's 'Eastern Church.'

† Murray's 'Hand Book.'



CHURCH OF THE ASSUMPTION.

the Tartars of the Crimea. Professor Piazzi Smyth, looking to the Kremlin from the south-east corner, says :—" Several towers are seen rising at intervals along the line of wall, with their half-" Gothic, half Tahtar spires, steep sloping roofs with bright green, leaf-shaped, tiling, and galleries of " columns and arches ever slightly varying from each other in their many tiers; the summits crowned " with strange, banner-like weathercocks, or Imperial double-headed eagles, while immediately within " this general enclosure are the golden decorations of more purely ecclesiastical buildings.

" And then to give distance to all this concentration of magnificence crowning the hilly ground " behind, there is below the walls an avenue of trees or boulevard, and below this again is the massive " quay wall, the deep stone stairs and landing stages, and the placid water beneath floating boats of " quaint unvarnished build.

" Again we turned about towards the west, and enfiladed in our view all the chiefest golden glories " of the Kremle: there was the palace, the Bolshoi Dvoretz, and there were the several holy cathedrals " of the Kremle, each with its separate congregation of golden domes, and the lofty tower of the Ivan " Veliki serving as a belfry for all them; and with Tahtar defence-castles and battlemented ramparts " in front of and below them. Gazing, as we then did from so close by, on the sheen of those golden " hemispheres, in such number and size, and placed just opposite to the sun and to our eyes, it struck " us as something more truly gorgeous than we had ever expected to behold upon earth; there is a " concentrated reflection of light on the various buildings, which at once bespeaks a new effect in " architecture. Glorious and masculine looks the gold, but more beautiful still the modest, pearl-like, " feminine domes of silver."

The finest range of towers is on the river side, where they are seven in number; that at the south-east angle is a graceful structure, the lower part forming a part of the battlemented walls, with a machicolated projection terminating the circular and lower part of the tower; above this it is octagonal, terminating in a thin lofty spire, covered with green tiles, the outline of the spire broken by a short vertical shaft with windows in it, and the outline of the lower part of the spire broken by lofty gabled window openings, bearing considerable resemblance, I think, to the upper part of the tower of the cathedral at Cremona. Then succeeds a series of five towers, the bases of which are all square; that next the south-eastern tower has a square upper story and octagonal stunted spire; in the two next the square base is surmounted by steep roofs with an upper story, and finished with a stunted spire. The tower at the south-west end is a somewhat more elaborate structure than either of those yet noticed. It corresponds and balances in style and composition with the south-east tower, which it closely resembles, and forms a very pleasing contrast both in form and proportion to the more solid and less ornamented square intervening towers. The difference between this tower and that at the south-east end of the wall is, that this has an additional machicolated cornice to the round base, and a little more ornament about the lower part of the octagonal spire. Beyond the long vista of towers on the river side is a modern church, much larger in size than the churches of the Kremlin, to which I shall hereafter refer,—it is the church of St. Saviour, still in progress. The interior is being finished—as I was informed, for I did not myself visit it—with the richest mosaics and coloured decoration. Externally the bulb-shaped domes are remarkably elegant in their contour. " It has been added to the countless " churches already existing in Moscow to commemorate the deliverance from the French invasion. " ' God with us ' is the motto which adorns the gateway, as it was the watchword of the armies of the " Czar. The 25th December, 1812, was the day of the retreat of the invaders. The religious services " of that day—Christmas day—are almost obscured by the services which celebrate the retreat of the " invader from Russian soil. It is the last of that long succession of national thanksgivings which " begin with the victory of the Don and the flight of Tamerlane, and end with the victory of the

" Beresina and the flight of Napoleon. 'How art thou fallen from Heaven, O Lucifer, son of the " 'morning.'—This is the lesson appointed for the services of that day. 'There shall be signs in the " sun, and in the moon, and in the stars, and upon the earth distress of nations, with perplexity. Look " 'up and lift up your heads, for your redemption draweth nigh.'—This is the Gospel for the day. " 'Who through faith subdueth kingdoms waxeth valiant in fight, turned to flight the armies of the " 'aliens.'—This is the Epistle."*

At the west end of the Kremlin walls, forming the truncated end of the triangle, is one other tower. It rises above the battlements, which are not here perforated with embrasures with a bold machicolated cornice to the lower part. There are two square stories, containing small windows, with lofty pediment heads, more approaching in character the Renaissance of Germany than that of Italy, with coupled columns at the angles, Byzantine in character, and above that a stone, or more probably white plastered octagonal arcaded story, terminated on each side of the octangle with a four-centered pediment. The spire which crowns the whole is of greenish slate, with three stories of window openings, the two lower also with lofty pedimented heads. This is called the Boris Tower, and is engraved in Fergusson's work.

On the north-west side there are four towers, including those at the angles; the most ornamental being the Troitza, or Trinity Tower. It has a square base, crowned with small angle turrets, and three four-centred arches on each side, one square story above that, one octagonal story over, and then a lofty spire, with pedimented blank windows round the lower part. This tower is said to have been built by Christoper Galloway, in the early part of the seventeenth century, restored in 1759, and after the conflagration in 1812. The French both entered and left the Kremlin by this gate. At that time there was a small bridge crossing the moat—now dry, no longer existing—and an outer tower, which latter still remains. The next tower to the south of the Troitza Tower, is a fine imposing building, carried up square, with bold machicolated cornice, the lofty roof of which, or truncated spire, covered with green tiles, carries an arcaded upper story, the columns and arches of which are distinctly Byzantine in character; and the whole is crowned by a low spire of stunted form, also covered with green slate. This tower, as some of the square towers on the river front, has a somewhat peculiar feature, namely, distinct vertical ribs, like the rolls in lead-work, dividing each face of the steep roof, and each side of the spire into two equal compartments.

On the east side, beginning with the south or river end, is the Round Tower I have already described. Next come two fine square towers, very similar in character, and as these stand at the rapidest part of the slope of the hill-side, the battlemented wall is stepped up between the two towers. The first is the largest; it has a machicolated cornice, then an arcaded story, with short triple columns at the angles, then a sloping truncated roof, with high pedimented window, then another arcaded story of two bold openings, and, lastly, a square spire, with a pediment-headed window on each side, crowned with a gilt weathercock. The second tower is very like that last described, but it is more slender in form; the roof has a more spire-like form, and the upper arcade has but one large opening. The spire, as well as the sides of the roof, are divided by vertical ribs. Both roofs are covered with green tiles. "Then " follows a quaint and picturesque little turret, standing on the top of the wall, and consisting of four " dumpy yet shapely columns, supporting a conical roof-spire. This is the *Tsarskaya Bashnya*, or the " Tsar's Tower, from whence the monarchs were accustomed to overlook the gatherings of their people on " great occasions; and in it was also once hung the chief spoil of Novgorod, the famous *vetchevai kolakol* " of that republican city. Often after its transplantation, it called the faithful of Moscow together for " aid of their state; but when, in blinded tumult, during the plague of 1770, the people rose in open

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* Stanley's 'Eastern Church.'

"insurrection, and with the tocsin of this bell, called up excited crowds, who rushed to the Donskoi "Sanctuary, and murdered the worthy archbishop Ambrosius, then the imperial mandate went forth "that the bell should be taken down, and suffer the extremest punishment that can befall its species, viz., "to have its tongue taken out, *i.e.*, its clapper removed. So in that dumb and mutilated condition, the "famous *vetchevoi* or *nabatnii kolokol* has remained ever since. But chiefest of all the towers on this "side, is that of the Gate of our Saviour, the *Spaskiya Vorotui.* The gateway has a long sort of tunnelled "archway, through the broad base of the building, and though strong and massive below, rises up like a "Gothic cathedral, through successive tiers of lighter and more aerial arches and pillars, to the final "spire, which aims ambitiously at heaven. There are holy pictures fixed over either entrance, and with "lamps, ever burning, hauled up in front of them: and each person who enters, high or low, rich or poor, "on foot or on horseback, has to take off his hat and keep it off for as long time as he is going through "the gateway. It was built by Peter Solarius, a Milanese, in 1491. Christopher Galloway, an English "clock-maker, already referred to as the architect of the Troitza Gate, built the tower above it in 1626, "and placed a clock in it, which was, however, later replaced by another; it is the Porta Sacra and Porta "Triumphalis of Moscow; over it is a picture of the Redeemer of Smolensk, held in high veneration by "the orthodox."*

Criminals executed in front of this gate, offered their last prayers on earth to the image of the Redeemer of Smolensk, which also witnessed the execution of the Strelesi, by order of Peter the Great. During my visit this gate was surrounded by scaffolding, the upper part, apparently, was left untouched, except for necessary repairs, but judging from photographs I have seen, the entrance gate has recently been considerably modified in form, and two small chapels, or shrines, one on each side of the gate, have been re-built in stone, in excellent taste, and affording a most pleasing example of that modern form of Russian architecture which has really an original and distinct character, founded on the older specimens of Russian architecture. I may also instance the elegant chapel which stands on the Nicholai Bridge at St. Petersburg, a small building in the Newski prospect, and some other more pretentious examples in the recently built Russian churches at Paris and Wiesbaden. This gate, nearly opposite to the Troitza gate and, in great part at least, attributed to the same architect, is very similar to it in style. The Nicholsky, or Nicholas Gate, is the last gate on the east side. The miraculous image of St. Nicholas of Mojacsk, the dread of perjurors and the comforter of suffering humanity, is suspended over it. Oaths were anciently administered to litigants in front of this venerated image. The tower was originally built in 1491, by an Italian architect, but has, like all the other buildings in the Kremlin, been restored after successive disasters. The troops of Tokhtamysh of Sigismund III., and of Napoleon, passed through this gate within four centuries. In 1408 it witnessed the siege of Moscow by Edegci; in 1551, the invasion by the Crim Tartars; and in 1611-12, the battles between the Poles and the Russians for Holy Moscow. It was also partly destroyed by the order of Napoleon, when it escaped with only a rent, which split the tower in the middle, as far as the frame of the picture, but not even the glass of the picture, nor even the lamp suspended before it, is said to have been injured. An inscription to that effect was placed over the gate by order of Alexander I. Architecturally, the gate is one of the least interest in the Kremlin walls. Fourteen successive restorations have ended in a very bad reproduction of the worst form of Milan-cathedral gothic.

"Having now described the Kremlin walls, I enter the interior. As the heart of Moscow is the "Kremlin, so the heart of Kremlin is the patriarchal cathedral—the Uspenski Sobore—the Church of "the Assumption, or Repose of the Virgin. This, one of the oldest and most interesting churches "in the Kremlin, is, in dimensions, what in the West would be called a chapel rather than a cathedral.

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* 'Three Cities of Russia.'

"But it is so fraught with recollections, so teeming with worshippers, so bursting with tombs and pictures, from the pavement up to the cupola, that its smallness of space is forgotten in the fulness of its contents. On the platform of its nave, from Ivan the Terrible downwards to this day, the Czars have been crowned. Along its altar-screens are deposited the most sacred pictures of Russia: that, painted by the Metropolitan, Peter; this, sent by the Greek Emperor Manuel; that, brought by Vladimir from Kherson. High in the cupola is the chapel, where, as at the summit of the Russian Church, the Russian Primates were elected. In the depth of the throne behind the altar, is the sacred picture which commemorates the original rock of Kieff, whence the see of Moscow was hewn. Round the walls are buried the primates of the church; at the four corners, here, as in all Oriental buildings, the place of honour, lie those most highly venerated. The floor is paved with slabs of polished steel. The four columns of the interior (for there are but four in an Orthodox Eastern Church), like the pillars in the great temple of Egyptian Thebes, though on an humbler scale, are painted round and round, with ever-recurring figures, as there, of Egyptian gods, so here of Christian martyrs; and as the walls there are hung from head to foot with battle pieces or sacred processions, so here with apostles, prophets, patriarchs, parables, history, and legend, closing on the western end with a huge representation of the Last Judgment, such as converted Vladimir to Christianity. In one sense the resemblance to Egypt is purely accidental, but in another sense, it is almost inevitable. Egypt and Russia are the only two great nations in which pictures or pictorial emblems have entered so deeply into the national life and religious instruction of the people. Hieroglyphics and pictures constituted more than half the learning of those grown-up children of the ancient world; and they still constitute more than half the education of these grown-up children of the modern world."* There is said to have been a church here in 1325. It was reconstructed between 1475 and 1479, by Aristotle Fiorasenti, of Bologna, with the assistance of native artists, after the model of the cathedral at Vladimir. The walls and vaults were considerably strengthened in 1626, and the domes covered with copper-gilt plates in 1684. But, notwithstanding these alterations, and others made after the great fire of 1737, the Cathedral of the Assumption probably retains its primitive form, and is, therefore, one of the most interesting Christian mouments in Russia. It is, externally, one of the least decorated of the churches of the Kremlin. The domed cupolas are larger and much less elongated than either of the other churches to which I shall have to refer. There is a simple necking round the shaft or drum of the centre cupola. The enclosing walls terminate on each face with three semicircular compartments, covered with a boldly overhanging roof, which forms a very effective shadow-producing cornice to the building. There is a very similar treatment of the walls, being terminated by a semicircular compartment, in the church of Santa Maria dei Miracoli, of Venice, built about 1490, which also has a dome of the same contour, nearly, as the Russian churches. At the east end the projecting roof serves to shelter the coloured decorations, which cover the upper part of the wall. And at this end, also, is the absidal termination; the centre portion of the five compartments of which it consists, is covered by a dome, and each of the two lateral absides is formed into one group, by the same roof covering two absides. The window openings on the shafts of the cupolas, are narrow, long, semicircular-headed windows, certainly not Byzantine in character, and much more resembling the long window openings of our own early churches, but there is no moulding or detail which gives character to them. The absidal projection at the east end, flanked by an extension of the lateral walls of the church, so as to enclose it, has, however, much more character; this has also long, narrow, square-headed windows, under a double-arched head, evidently merely ornamental and not constructive. These windows, again, are not Byzantine in character, but all the rest has this

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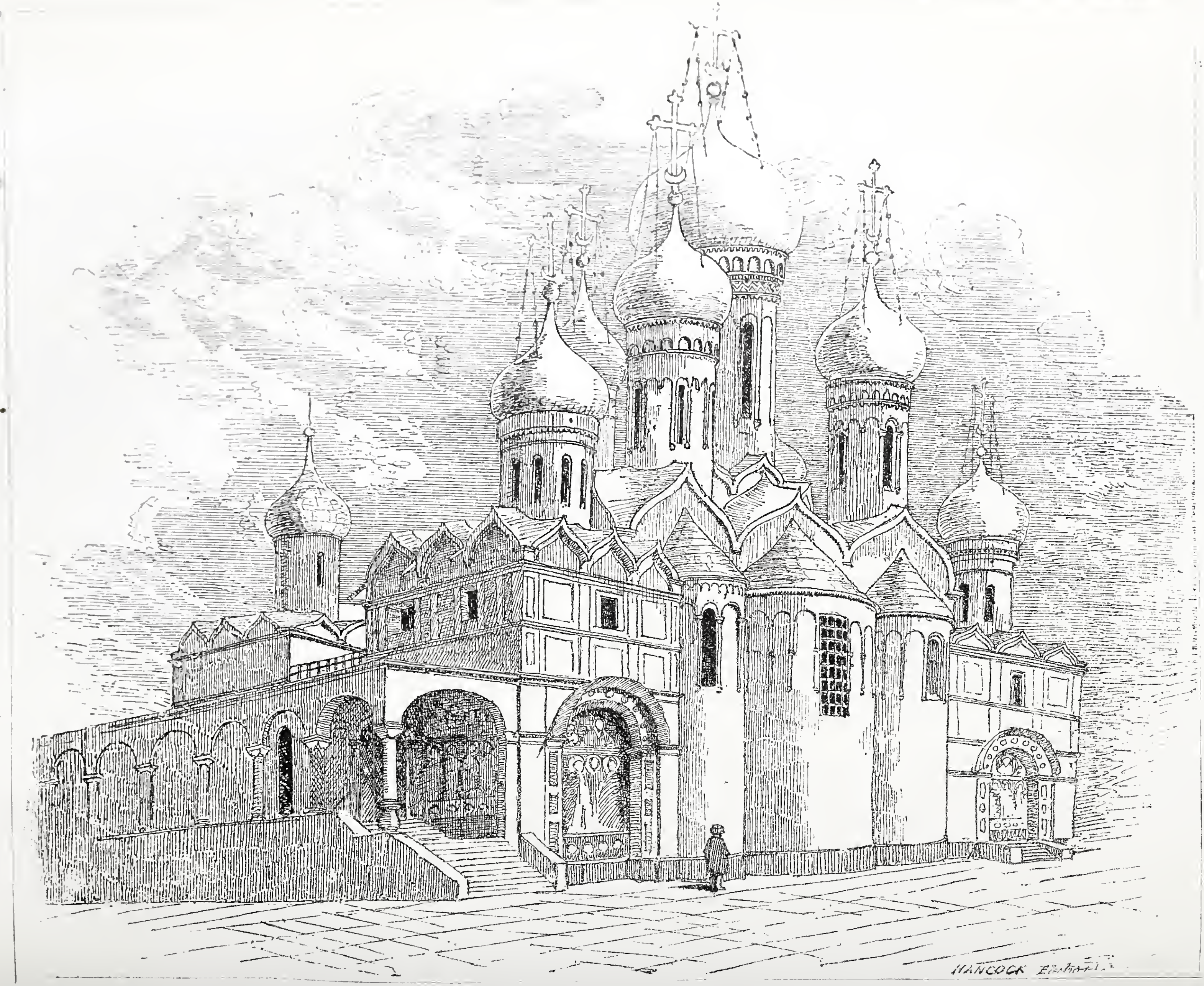
* Stanley's 'Eastern Church.'



CHURCH OF THE ANNUNCIATION.

character very distinctly—the small delicate mouldings of the slight cornice, and the flat rounded projections which are used, as the Italian architect would use pilasters, are counterparts in character; with similar features in the fountains of Constantinople, and the cornice before referred to, is of the same type as the fountains of Constantinople, or the shafts of the columns in the Palace of the Alhambra.

" Next in situation and in size is, the church of the Archangelskoi Sobon. Here lie, each " in his place, the coffins ranged around the wall, the long succession of czars, from the founder of " Moscow to the predecessor of the founder of Petersburg. Round the walls, above each coffin, are the " figures painted in long white robes, each with a glory round his head, not the glory of saintly " canonisation, but of imperial canonisation. Twice a year a funeral service is performed for the sins " of all of them. Of all those who there lie buried, under " that burden of sins,"—so the service solemnly " expresses it—" voluntary or involuntary, known to themselves or unknown,"—none more strangely " and significantly indicates the mixed character of the Russian czar, or the hold which the office had " acquired on the people, than he who, as the first crowned and anointed czar of the Muscovy, lies " next the altar, in the most sacred place, Ivan or John IV., surnamed 'The Terrible.' "* This church was founded at the same time as the Uspenski Sobor, destined to receive the remains of the sovereigns of Russia, as that of St. Michael was to be the place of sepulture of the patriarchs. It is as large, if not larger, than the Uspenski Sobor, but externally it differs much from it. The body of the church is larger, and the absidal portion less developed.

The outer walls terminate in low pediments, five on the longer sides of the church, and three at the east and west ends, within each of which is a low arched panel, filled with a shell ornament.

The detail, both of this part and of the cornice and pilasters, with which the exterior walls are decorated, is rude Italian work, of the cinque cento period. The scroll ornament, however, over the north doorway, bears a much closer resemblance to the strap-work of the German Renaissance. The tambour of the cupolas has an arcaded decoration with slender pillars attached, and below each alternate arch is a long, narrow, round-headed window. The four smaller domes are silvered instead of gilt, but the large central dome, like most of the domes in the Kremlin, is gilt. The windows in the external walls are also long, narrow windows, and out of harmony with the Italian character of the façades. The east end has an absidal termination, in three distinct compartments, but these are low, and form no prominent feature. Internally, the church is the same in character as the Uspenski Sobor. It is said to have been built in 1416, to commemorate the deliverance of Russia from a dreadful famine, but if any part of it survived the ravages of the Tartar invasion, in 1571, it must have been modernized, and externally Italianized at a considerably later period than 1416.

Near to the two last-named churches, is the third most important church in the Kremlin, completing the group of those intimately connected with the history of the czars. This is the cathedral of the Annunciation—the Blago Veschenski Sobor—in which the czars are baptized and married. It is the smallest of this group of the three monumental churches of the Kremlim. The walls of the square church, instead of being terminated by semicircular-formed compartments, are here terminated by compartments in the shape of a four-centered arch; the apex of the arch pointing upwards. The cupolas are stilted on comparatively lofty tambours or shafts, but there is here considerably more attempt at ornament, as each shaft, especially the centre shaft, has a flat but elegant cornice. Each shaft is arcaded with slender attached columns, and under each alternate arch is a long narrow window. The east end has, like the other churches, an absidal termination, but here are three very distinct compartments, each surmounted by its own conical roof, the upper part of which rises up into the arched compartments, forming the upper part of the external walls. This church has four attached wings, and each wing has a dome-capped cupola; so that, altogether, the church has nine golden domes; and not only are the domes gilt, but the whole roof is gilt, which gives a wonderful richness of effect to this small building. On the wings of the east front are two large painted decorations. The church is entered by a porch terminated by a colonnade, which connects this church with the Palace. The walls of the porch are painted with figures of the Greek philosophers, as heralds of the coming of Christ; and the columns of the colonnades, especially those nearest the church, are peculiar in the detail. They closely resembles the columns of the smaller turret, next the Holy gate, and to seek an example in Western Europe, I know nothing so nearly approaching to them as the columns surrounding the court of the Bishop's Palace at Liege. The door leading from the porch to the church is a rude but direct imitation of the cinque cento work of Italy, full of ornament, and all now covered with a coating of light blue paint. Internally there is a magnificent iconostasis, rich with gold and jewels, and the floor of the church is paved with jasper. I can find no mention of the date of this building, but it is anterior to the time of Ivan the Terrible, for he, when reduced by his transgressions of the canon law to the state of a catechumen, listened outside to the mass celebrated within. This was about 1550, and the church is probably a little anterior to that date.

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* Stanley's 'Eastern Church.'

There is another church very near these three more important churches—the Church of the Twelve Apostles. It is annexed at the west end to a group of other buildings, forming the office of the Holy Synod. The exterior I did not visit; nor do I find in either of the books to which I have had reference any notice as to its date; to all appearance it is as old as the Uspenski Sobore. The body of the church is square; it has the four cupolas at the four angles, and one in the centre dome capped and gilt, and of course crowned by the lofty Greek cross. The four angle cupolas are perforated with long narrow semi-circular headed windows, and decorated with slender shafts corbelled out from the walls, with arched heads over the windows. These arches surround the shaft of the cupola, and the window openings occur in every alternate arch. The enclosing walls terminate with three semi-circular compartments, over which projects the overhanging roof. At the east end is an absidal temination in three absides. The roof forms a lean-to against the east wall, and above it and under the broad overhanging eaves of the roof, as at the Uspenski Sobor, are coloured decorations.

Amongst the other objects of interest in the Kremlin is the lofty tower or belfry of Ivan Veleki—John the Great. It was erected in the year 1600 by the Czar Borisgodunoff. The cross on the summit is 18 feet high, and the total height about 270 feet. It is one of the buildings which was injured by the French during their occupation of Moscow, but I could discover no traces of the injury—plaster and whitewash have effectually concealed it. In the lower part is a chapel dedicated to St. John of the Ladder; the tower being, in fact, its campanile. Above this are suspended thirty-four bells; the largest weighs 64 tons, about 140,000 lbs., and although this is not one-third of the weight of the great bell which lies below it, it is still five times as heavy as the famous bell of Erfurt and four times that of Rouen. To compare it with some other well-known bells, I may mention that of St. Peter's at Rome, which weighs 18,607 lbs.; St. Paul's, London, 8,400 lbs.; Great Tom, Oxford, 17,000 lbs. It was recast in 1812. The most ancient of the other bells bear the date of 1550. In the upper story are two small silver bells of exquisite tones. The celebrated great bell lies at the foot of the tower. It was cast in 1733, and broken by the fall of some heavy timber in 1737. Its weight at present is 440,000 lbs., its height 19 feet 3 inches, and the circumference 60 feet 9 inches. The art of bell-casting was known in Russia as early as the fourteenth century, but was only brought to perfection in the sixteenth, when the first large bell was cast in Moscow, 1553, which weighed 36,000 lbs. The last great casting, however, which was made in Russia—a monument of considerable beauty, of which the contour closely resembles the bell form, and which is placed in the ancient city of Novgorod, was cast by an English firm in St. Petersburg, in 1862, in commemoration of the one-thousandth anniversary of the Russian empire.

In size no building in the Kremlin approaches that of the Palace and Treasury combined. It occupies the site of a palace built by the Empress Catherine the Second, which was destroyed by the French, and rebuilt by Nicholas the First between 1838 and 1849. The interior contains numerous magnificent modern rooms. It also contains several more interesting and more ancient portions—the Zolotaya Palata, or Gold Court; the Red Staircase, only used on important State occasions, when the Emperor goes to the Cathedral of the Assumption, and up whose steps Napoleon, attended by his marshals, ascended to take possession of the Palace of the Kremlin; the Granovetaya Palata, or Banqueting Room, where the Emperor sits enthroned after the coronation ceremony at the cathedral, adorned for the first time with all the Imperial insignia, and dines amidst his nobles; the Terem, anciently devoted to the use of the Tzarrona and her children; the two lower stories built in the early part of the sixteenth century, and the two upper added in 1636 by Michael Fedorowisch. Within the Palace is also a labyrinth of fourteen chapels, multiplied by sovereign after sovereign, till the palace is more like the dwelling-place of the Pope than of the Emperor. These chapels, crabbed-ribbed, low-browed, painted within and without in the old barbaric grotesqueness of mediæval Russia, are encased with the external magnificence of modern civilisation and European grandeur. The Treasury which adjoins the Palace—the Orajeinaya Palata—was erected in 1851. It contains a vast collection of trophies and standards, coronation chairs, magnificent State robes, crowns, imperial orbs, plate, some portraits, saddles and horse-trappings. Amongst the other objects is an ivory throne, brought from Constantinople by Sophia Palæologus in 1472 on her marriage with John the Third. There is a throne also which came from Persia in 1660, and was used by the Czar Alexis; it is studded with 876 diamonds and 1,223 rubies, besides turquoise and pearls. There is an orb, sent to Vladimir Monomachus, Prince of Kief, by the Greek Emperors Basilius and Constantine, together with a crown or collar of enamel and precious stones, and a chair with a piece of the true cross. These objects are also profusely adorned with jewels, and the coloured enamels are in the most beautiful style of Greek art, representing the principal episodes in the life of David. There is the crown of the kingdom of Kazan, which belonged to Simeon, Czar of Kazan, converted to Christianity by John the Terrible in 1553. The throne of Boris Godonoff, the gift of Abbas Shah of Persia, in 1604, studded with very large turquoises and innumerable rubies and pearls. There is a crown containing 900 diamonds, an orb made at Constantinople in 1662, and these are some only out of the many costly treasures of this building. One of the ivory thrones of Byzantine work is of great interest and value, the carving being very elaborate and of remarkable beauty. This collection, rich in Oriental work of India, Persia, Armenia, and Greece, contains many objects of rare beauty, of very great intrinsic value and archæological interest. They are very fully and well illustrated in a fine series of coloured prints issued in five volumes by the Russian Government, of which we possess copies at the British Museum and at the London Institution.

There is still another palace, called the Maloi Dvorets; a small church, one of those encased in the Palace; the Sacristy of the Holy Synod; the Miracle Monastery, with its church close to the Redeemer Gate; the Ascension Convent; the High Court of Appeal; and several Government buildings. That which I will last allude to—the Arsenal, which stands close to the Nicholas Gate, is a building of the date of 1713; but what is here most interesting is the long array of cannon outside the building, next the most frequented road into the Kremlin, trophies taken by the Russians to the large number of 875, of which no less than 365 are the cannon taken during the retreat of the French, and as the least honourable place these lie prostrate on the ground; the Austrian, Prussian, Italian, and others (*none, however, English*) lie tier above tier over the French pieces below. Outside the Kremlin, and so immediately adjoining it as to enter into the grouping of all the buildings of the Kremlin, is the church, known as the Church of St. Basil. "This title is, however, only "founded on truth, for though there may be, and indeed is, such a church as the Church of St. Basil in "the general structure, still it is only one of twenty-one churches which are there coexistent, the whole "together being known to the natives as Pokrovskoi Sobore, *i. e.*, Cathedral of the Protection. Yet "Sobore cannot literally be interpreted 'Cathedral,' for see practically what it means here. There is a "building of very moderate size, *i. e.*, circumscribed probably within 150 feet square on the ground, "agreeably spiral in form, with nearly a dozen domes grouped round a central summit, like a close "clustering grove of young pine trees. There is harmony amongst them decidedly, yet with variety "infinite. One dome is wreathed to the right, another to the left, one decorated with triangular spikes, "another with quadrilateral; and, in short, everywhere, even amongst seeming repetitions there are "charming refinements of variations."* Over and above are the strangest little intercalated windows and doors, and open passages peeping out in unexpected places,—side by side, though, it is true, with lamentable paintings of Southern plants. The titles of each of the coalesced churches are thus given by Lyall:—In the upper story of the church, that dedicated to—

1. The Entry of Jesus Christ into Jerusalem.
2. The Life-giving Trinity.
3. Gregory the Great, of Armenia.
4. The Three Patriarchs of Constantinople, Alexander, Joann, and the New Paul (never consecrated).
5. Kirprian and Justin.
6. Alexander Svirskii.
7. Varleism Hutmiskii.
8. The Church of Nicolai the Miracle Worker.
9. The Virgin Pheodosiya.

In the ground story, that dedicated to—

10. Vasilii Blazinnii, or Vasilii the Blessed.
11. The Birth of the Virgin Mary.
12. The Martyr Parascovya Pianitsa.
13. The Great Vasilii.
14. John the Precursor.
15. All Saints.
16. The Epiphany.
17. Sezzii the Miracle-worker.
18. The Apostle Adronik.
19. A pridel or adjoining chapel.
20. Mariya Yegipels Kiya.
21. Pokrovi.

The whole forming the Pokrovskoi Sabore, a most original, subtile, and in some things beautiful work of art, and no unworthy monument for Ivan Vassilievitch II. to have erected as a mark of his conquests over Kazan, and Russia's definite triumph over her ancient Tahtar oppressors. The following, too, is the style of the spirit in which the building was erected, as even yet testified to by a sculptured inscription:—"By the blessing of God by the mercy of the Most Holy Virgin Mary, and by

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* 'Three Cities of Russia.'

" the prayers of all the saints, by order of the most pious Tzar and Great Duke of all Russia, Ivan " Vassilevitch, and of his Eminence Makarii, the Metropolitan, in the year 7062 (1554), was begun the " construction of the Church of the Pokrove of the Most Holy Mother of God, and also on the same " foundation, nine churches." And then comes this subsequent addition " By order of the Tsar and the " Great Duke Phedor Ivannovitch, in the year 1588 (?), were added yet other eight churches in this " edifice."

This church is two stories in height; each dome covers a separate church, so small that we should call it a chapel, and the exterior is elaborately decorated, the domes in green and yellow, and the walls of the lower part with pale green and white, and some red lines, very coarse representation of rock work, and the flower pot ornament which is common on the Constantinopolitan fountains, there chiselled on the marble with great grace, but here very coarsely executed. I noticed on the sides a representation of wood logs placed upright forming part of the walls. I did not notice this peculiarity in any other building, and I feel pretty confident it is not a feature in any of the buildings at Constantinople, so that this may be a peculiarity of Tartar architecture.

I may here mention that I observed in Murray's handbook for Russia that it is supposed that traces of Mongul architecture are to be found at Kazan. I went and carefully viewed the walls of the Kremlin there, but could discover nothing differing from the architecture which I had previously seen in Russia. The external decoration of St. Bazil Church, or of this aggregation of churches, was perfectly fresh and bright when I saw it.

Fergusson says in reference to this church—If German workmen erected this building it certainly was from Tartar designs—nothing like it exists to the westward, it more resembles the Kylas at Ellora or the Baths of Mahaxellipon than any European structure, and in fact must be considered as almost purely a Tartar building. Still, though strangely altered by time, most of the forms can be traced back to the Byzantine style as certainly as the details of the Cathedral of Cologne to the Romanesque. The central spire, for instance, is the form into which the Russians had during five centuries gradually changed the straight-lined dome of the Armenians. The eight others are the Byzantine domes converted by degrees into the bulb-like forms which the Tartars practised at Agra and Delhi as well as throughout Russia. The architect employed was an Italian architect, and there is tradition that Ivan the Terrible ordered his eyes to be put out that no similar building might thereafter be erected, but this rests on no good foundation, and illustrates rather the traditional character of Ivan than any well founded fact. I have hitherto dwelt on the Kremlin because that and its immediate surroundings was the part of the city to which during my too short visit I paid almost exclusive attention; it however forms but a small part of the whole town.

Immediately adjoining it to the north-east is the Kitai Gorod or Chinese quarter, it is the mercantile part of the town and is walled round like the Kremlin; this also has its ancient gates and several ancient (ancient for Russia) buildings within its walls. One of them is a small church, " The Mother of God of Georgia," which is a perfectly typical church—a building nearly square in form, from the roof of which rises elongated, octagonal spires crowned with five bulbous-shaped gilt domes terminated by the usual lofty cross standing over the crescent. The cross on the centre dome is highly ornamented and comparatively gigantic in size. The others are large, but plain—all strictly Grecian Church orthodox, with the short head bar, the long arm bar, and the diagonal foot bar, for they say that one of our Saviour's feet was nailed higher than the other. One of the spires, or turret and spire which crowns part of the building, rises out of a series of small arched constructions, the faces of which are deeply moulded. In the same building there are many variations of the same feature; it occurs also in the Church of St. Basil—in that of Nishni Novgorod, and probably has a much wider range, and, indeed, is a general and characteristic feature. I am not sufficiently acquaintad with Eastern architecture to know whence this peculiarity is derived, but it may be fairly assumed that there is one common origin from which it has been derived and applied in the churches of Russia, in a small circular tower at Worms in Germany, attached to the west front of the cathedral, the covering dome rises out of very similarly shaped projections or constructions built on the square tower, and has on the whole a remarkably Byzantine character. (See illustrations 'Architectural Publication Society,' Part 2, Vol. 1854-1855.) In the Romanesque churches in the south and south-west of France with which I am acquainted, there is also often some small erection on the top of the square tower of similar character which helps to combine the inclined line of its pyramidal roof with the vertical lines of the tower; and one church in particular occurs to me, namely, the Cathedral at Angoulême, where the spire is entirely formed of a series of semicircular projections standing one above the other.

Besides the churches, the Kitai Gorod contains several chapels, two of the most frequented being in the main street leading to the St. Nicholas Gate in the Kremlin; and that attached to the church of the Mother of God of Vladimir, close to the Nicholaiska Gate, seems to be highly reverenced, judging by the crowds which are always prostrated before it. Here also is the Corn Magazine, the Custom House, the Fish Market, and the remarkably Russian Institution of the Gostinoi Dvor—an establishment peculiar to Russia, and closely resembling the bazaars of Constantinople, or the French passages. The building consists of numerous avenues of very small shops rudely and solidly built, small and ill-lit, but teeming with life and full of merchandize. At St. Petersburgh there are two similar establishments of great size in the Newski prospect.

The modern churches of Moscow, and I may add the others I saw in Russia, are in the Italian style generally of the worst character. I do not except the celebrated church of "Our Lady of Kaz n," at St. Petersburg—but I do except one great church there, the work of a French architect, the St. Isaac's Church, to describe which would go beyond the limits I have proposed to myself in this paper. I cannot, however, refrain from observing that it is a grand and imposing building; it has the usual central dome, and the four small surrounding domes common to all the Russian churches. Its great ribbed dome is covered, it is said, with actual plates of gold; and all the dignity which can he conferred by materials of cyclopean size—monolith columns of granite, capitals and other decorations of bronze, bases of burnished brass, have been bestowed on its imposing exterior; whilst internally, its walls are lined with mosaics of richest marble, its iconostasis covered with gold and paintings, and adorned with columns of lapis lazuli and malachite. The Imperial records have never revealed its cost. It is a great, but it is not a Russian work.

A striking feature in the neighbourhood of Moscow, is the number of important monasteries. They stud the plain in many directions, and are most of them very extensive, for they contain within their walls large conventual buildings, and many chapels, bell towers, and burial places.

At the important monastery of Simonoff, there is a burial place of great repute, where many of the nobles are buried, and by the money paid for the right of reposing in this much coveted resting place, and the maintenance of the small flame of fire which is constantly kept burning over the bodies, or as long as it is duly paid for, the income of the convent is much augmented.

" About forty miles from Moscow, is one of the most remarkable of these establishments, in the " midst of the wild forest which covers all the uncultivated ground of the Russian soil, rises the immense " pile of the ancient convent of Troitza. Like the Kremlin, it combines the various institutions of " monastery, university, palace, cathedral, churches, placed within a circuit of the walls, which by their " height and strength, and towers and trench, indicate that over and above all these other elements of life, " was superadded in a predominant degree that of a camp or fortress. Hither, from all parts of the

" empire, stream innumerable pilgrims. Every village along the road from Moscow is consecrated by " some religious or historical association. No emperor comes to Moscow without paying his devotions " there. The terrible Ivan built at least half of its stately edifices. Peter twice took refuge within its " sacred walls. The wicked Catharine used to go thither from Moscow with all her court on foot. On " foot many of the nobles of the present day have made their first pilgrimage. No presents are so " welcome to their families on their return, as the memorials of sacred bread, or sacred relics, from 'the " Laura,' or convent of the Holy Trinity. The office of Archimandrite, or Abbot, is so high, that for " many years it has never been given to any one but the Metropolitan of Moscow ; the actual chief, the " Hegomenos, or Prior, is himself one of the highest dignitaries of Russia, and lives in a style of " magnificence, which is to our eyes rather like that of the heads of our grandest colleges, than of the " ruler of a monastic establishment. 'Whence do you derive your support of all this state?' asks the " Emperor Nicholas of the present Prior. He answered nothing, but pointed to the chest, which at that " moment, and at all hours of the day, was receiving the offerings of the long array of pilgrims, and " which has contributed in no slight degree to the necessities of the empire."* Of the thousands of pilgrims who resort here, all who seek it are received at the table of the monks and partake of their fare, and eat the consecrated bread prepared for them. Here is also a permanent school of art, where figures of the Russian saints, of our Saviour, of the Father, of the Virgin, are produced in large numbers in execution of orders, or to the pilgrims who desire to purchase. I must have seen in that part of the establishment into which I went, not less than thirty or forty lads, some of them quite young, in training for the work, and some carrying it out. The sale of sacred pictures in Russia must be enormous, for you enter no room of rich or poor, in which a painting more or less valuable, is not to be seen fastened mostly in the corner of the room and near the ceiling; and in the churches nothing is more striking than the gorgeous and costly magnificence with which the figures of the saints are enriched. Although it is unlawful to have graven images, yet embossed gold plates are constantly placed to form the back ground of the figures; and round the golden nimbus, or placed upon it, it is by no means uncommon to find diamonds, pearls, and other precious stones, the money value of which is estimated at £30,000. The gold and precious stones on the celebrated painting of our Lady of Kazan, which one of the nuns there during the evening service, and without abating her own devotions in the least degree, displayed to us by the light of a lamp which she lowered for that purpose, is surrounded by a profusion of costly jewels, and crowned with an immense crown studded in diamonds, the gift of the Empress Catharine II.

The general impression formed by such survey as I had the opportunity of making of the Russian churches is, as I have already observed, that they are very small in size.

The iconostasis, or screen, is always superbly gilt and covered with a mass of gilded pictures, none of any artistic value, and all conceived in a stiff and formal style, mostly single figures and heads, or if groups, groups of conventional uniformity, shewing the Father surrounded by angels or saints, or the Virgin seated in an ivory chair, carrying the Infant Jesus; and in many of the churches, in all those I have dessribed in the Kremlin of Moscow (where the national feeling is best represented), the whole walls, from the floor to the dome-capped cupolas in the roof, are covered with paintings of saints, of the Virgin and of the Deity. In a paper read before the Institute by Herr. Hallman of Hanover, in 1840, he gives a very full description, as well as an elevation of the iconostasis, or image bearer of the Greek church, in which he describes the number of doors it contains, the different tiers of pictures, and the subjects of which these pictures consist. Another characteristic of the Eastern church generally, but eminently characteristic of the Russian ecclesiastical history, is the veneration for sacred pictures ; no veneration of relics or images in the West can convey any adequate notion of the veneration for pictures in Russia ; it is the main support of their religious faith and practice. Everywhere, in public or in private, the sacred picture is the consecrating element. In the corner of every room, at the corner of every street, over gateways, in offices, in steamers, in stations, in taverns, is the picture hung with the lamp burning before it. In domestic life it plays the part of the family Bible, of the wedding gift, of the birth-day present, of the ancestral portrait. In the national life it is the watch-word, the flag which has supported the courage of generals and roused the patriotism of troops ; it has gone forth to meet the Tartars, or the Poles or the French ; it has thus been carried by Demetrius, by Peter, by Suwarof, by Kutuzofa. A taste, a passion for pictures, not as works of art, but as emblems, lessons, as instructions, is thus engendered and multiplied in common life beyond all example elsewhere. It is against the canons of the church to have any graven images, and therefore the decoration is confined to pictorial representations ; but the strict rule is often departed from by embossing the gold background to the picture, and the jewelled crown by which they are surrounded are in full relief. St. Isaac's Church, the great modern church of St. Petersburg—the work of French architects—is the only church in which I recollect this rigid rule having been departed from.

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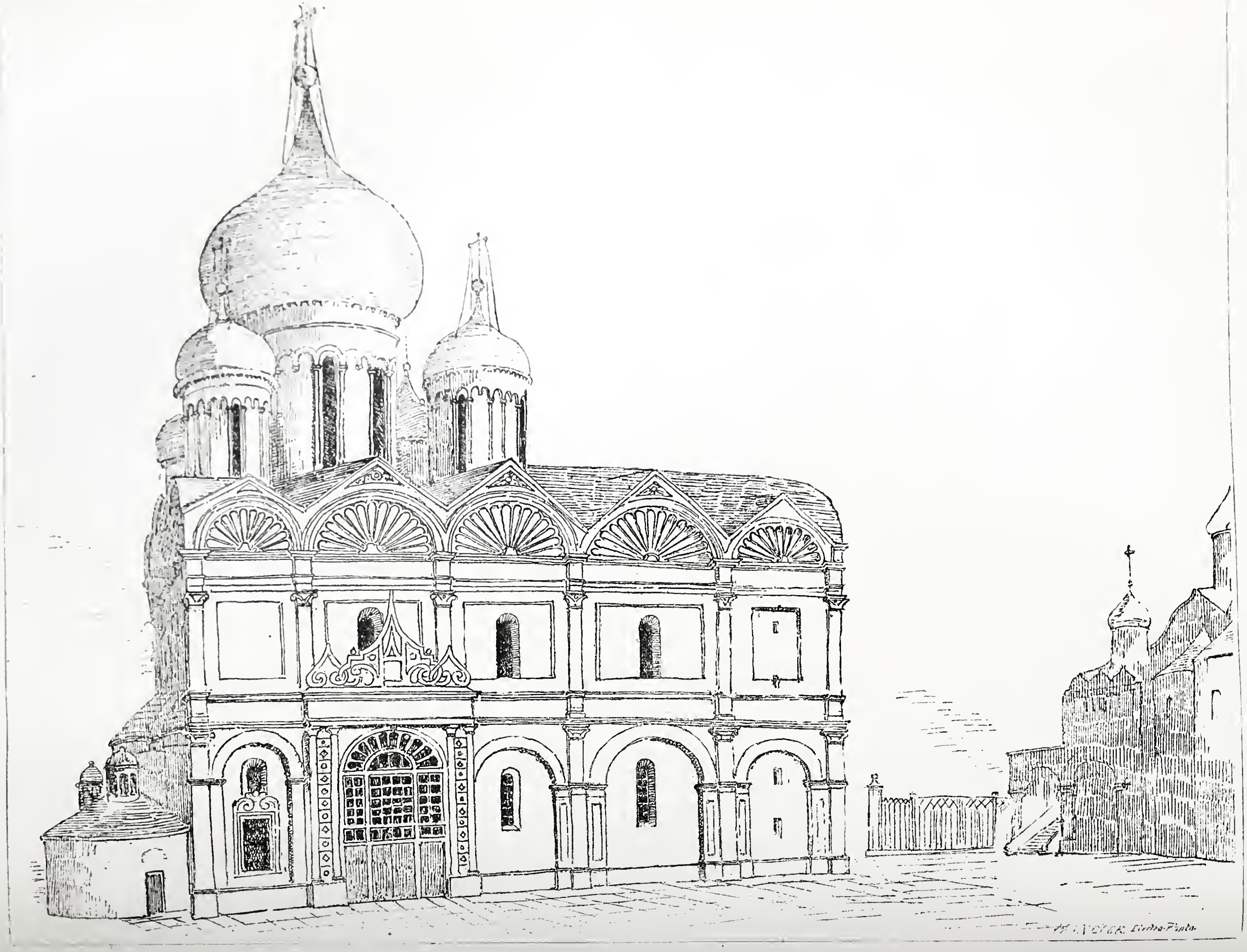
* Stanley's 'Eastern Church.'

The spaces behind the iconotasis is shut off from the public, and although women are on no account allowed to enter here, men are not excluded ; and in two or three churches—of which this part was visited by me—I found that all was as simple and undecorated as possible, in fact, it seemed that little use was made of this portion of the edifice, except the centre apse bema, or sanctury, where the altar, of the simplest, even meanest form, stands, and where the Elements are consecrated, and from thence brought out through the royal doors, to the worshippers in the church ; and also as regards the lateral apses, that they are used as priests' robing rooms. Dean Stanley, in his plan of the Uspenski Sobore, shows that the lateral apses have altars or shrines consecrated to particular saints, but when I had the opportunity of entering behind the iconostases, I observed no attempt at decoration, and saw no instance of their being used for worship. This absidal termination, so far as I saw, was a constant feature : sometimes, and generally, it is a group of absides, as at the church of the Holy Apostles, and the church of the Annunciation, and sometimes of five, as at the Uspenski Sobore But they do not occur singly, as in the Romanesque and more modern churches, nor of less width than the body of the church. They form in all cases which I noticed, a prolongation of the body of the church without any break. I do dot recollect any similar feature in the architecture of Constantinople, but we know it is a feature in the early Christian Byzantine churches, and I doubt not it is thence derived. There is but one single central apse at St. Sophia, as in the later churches, but in the Greek Church of St. Marie, at Saint Germano, there are three absides extending together the whole width of the church. There is a church of the tenth or eleventh century, in the Island of St. Catherine, at Pola, in Istria, which has three absides ; and, lastly, I may cite the Greek Church of St. Mark, of Venice, of the tenth century, which, internally, has three distinct apses, but externally, the influence of Latin architecture has prevailed, so that the two lateral apsides are masked by square walls, and the central apse above shows.

Another striking feature to which I have alluded, is the marvellous value of the decorations of gold and silver and precious stones in the churches, shrines or tombes, such as those at Troitza, of silver, jewelled diadems and crowns, which surround all the most venerated pictures. The priests, often, by the way, men of great stature, clad in heavy gold and pearl-embroidered robes, and all this the more striking in a country where there is hardly any metallic currency in circulation.

The body of the church is always supported on four columns, but there is in some of the churches a



CHURCH OF THE ARCHANGEL.

pronoas which elongates the body of the church, and then two more columns are introduced; and although it is not so in the Kremlin, where the lofty tower of Ivan Valeski, serves as belfry for all the churches; in most of the other churches I saw there was a belfry forming part of the building.

Another point is, the wonderful effect of the gilt domes, which, when seen in broad masses, is marvellously effective: the play of light is almost inconceivably brilliant, and so reflecting is the surface, that all surrounding objects are vividly pictured on the polished surfaces; and as every moving object passes by, the reflection gives a constant play and movement on the burnished gold surface.

There is yet another feature which is very distinctive, and intensely Russian, namely the peculiarly lofty crosses, and the chains or rods by which, like the rigging of a ship's masts, they are connected and supported by the dome.

All the buildings, except those immediately under repair, have an air of antiquity. The signs of architectural age are not the same in Central Russia as in Western Europe: in the West you look to the slow wearing effects of wind and rain, in removing the finer ornamentation from sculptured blocks; but in Moskova, the terrific frosts of winter, followed immedintely by the raging heats of summer, would make short work of any builder's stone, even the best; and immortality is, consequently, tried to be secured there by that material which most easily admits of renewal, and touching-up every spring of its life. Fortunately, for the preservation of the churches, the great superstition which prevails in Russia, furnishes the necessary funds for what must be a very costly work; not only the repairs of the walls, but the large amount of gilding to the roofs and domes. Individual bequests are made for the specific, and in this climate of extreme severity, very necessary work.

The source from whence the architecture of Moscow is derived, is, I think, clearly Constantinople. The historical evidence on this point is conclusive, but you will probably think this notice has been already sufficiently prolonged without here reciting it. In the absence of history, any observer who has seen the architecture of Constantinople, cannot doubt as to its being the parent of that of Russia.

We may be pretty sure, both from the evidence of history and of the architecture itself, that there is nothing in Moscow much earlier than the time of the last Tartar invasion, in 1571, before the Kremlin was destroyed by fire. About a century before Constantinople had been taken by the Turks, 1453, and it was between that time and the beginning of the seventeenth century, that the great mosques and fountains and tombs, which adorn Constantinople, were built. The Uspenski Sobore, we have seen, was built in 1475 to 1479. The Archangel Church, founded 1416, but probably built fifty or a hundred years later; and the Church of the Annunciation is probably about 1500; in these Italian architects were employed, assisted by native or foreign workmen. In the case of the Uspenski Sobore, built 1554, we are told by German workmen, but probably, generally, it was the native artificers who carried out the work. As regards the Kremlin towers, although they possess a distinct, and probably Eastern character, yet there is a more complete Italian feeling than in the churches. No doubt the plan of the churches was precisely defined by the tradition and usages of the Greek Church, and the whole treatment was traditional, just as we in England now cling to the older form practised in church buildings. Moreover, however Italian in feeling the architects might have been, they were evidently influenced by the state of the arts as they found them in Russia, and by the state and predilections of the Russians—social as well as religious. All their relations were then with the East, and the great metropolis, Constantinople. The reigning sovereigns had married relatives of the Greek emperors. The thrones used at the coronation of the emperors, their crowns and diadems, and, indeed, all their works of art, seem to have come from the East, and are, as I have already mentioned, very fully illustrated by the interesting and costly collection of works of art contained in the collection in the Palace of the Kremlin. Governed by these influences, just as the Norman architects in Sicily were governed by the influence of the Byzantine works they found there, or as Serlio was influenced when he built at Fontainebleau by the French architecture which surrounded him, so the Italian architects in Russia, after, as a matter of necessity adopting the form of the Greek cross, were inspired largely by the influence of Constantinopolitan art.

There cannot be a more suggestive type of the architecture of the Kremlin churches than several of the fine fountains in Constantinople. Take the fountain of Sultan Selim—its fine domed-capped cupola is the exact counterpart of the arrangement of the churches of Russia, and although I cannot recollect them by name, yet I think there is at least one other fountain at Constantinople (? the fountain of Sultan Mamhoud at Tophane) which is precisely similar in character and arrangement of the domed cupolas on its roof. There is a little matter of detail, the exact counterpart of the same feature in Constantinople, namely, the small perforated pendant of metal fringe-work which falls from the lower overhanging portions of the domes; it is a feature of course not accidental, is identical and a clear repetition. Then, again, I can point at least to one instance, where the dome covering is formed in distinct ribs; this is at the Soulimanie Mosque. The dome has not the same outline as those of Constantinople, I think they are more graceful; they approach nearer to the form used in the Tombs of the Caliphs at Cairo. The contour of the dome of the modern church of St. Sauveur near the west end of the Kremlin, is a remarkably graceful example. The cupolas which carry the domes are not so lofty in the Constantinople fountains to which I have referred, but this is a small variation, and I think there is no room for doubt, that Constantinople suggested the design of the churches of Moscow, and the Italian architects to whom they were intrusted, worked out the Constantinopolitan model with such Italian details as they had seen in their native country; and, as generally happens, whilst they did not catch all the beauty of the style they sought to adopt, they lost, or failed to get properly carried out by the native artists the Italian details and forms which they applied to the work intrusted to their care.

Although the relations between the two nations has from political causes in modern times not been always preserved, in earlier times and in ecclesiastical matters the relations between the two were always preserved with filial fidelity; the more remarkable from the reversal of their respective positions in everything else. It is this which makes the Russian Church so truly Eastern. France, Spain, and Germany have all in divers degrees ceased to represent the type of the Roman Church to which they owe their first faith; but in the Cathedral of Moscow is still maintained, in essential points, the likeness of the worship which won the hearts of Vladimir's ambassadors in the Cathedral of St. Sophia; and although the jurisdiction of the Patriarch of Constantinople has been gradually relaxed in proportion to the increasing power of the Russian hierarchy and nation, yet the outward bond between the two churches has never been broken. The Metropolitans of Russia were for five centuries either Byzantine or closely allied to Byzantium. Every successive change in their condition since has been confirmed by the Church of Constantinople. The transference of the See from Kieff to Moscow, the elevation of the primacy into a patriarchate, and, finally, the transformation of the patriarchate into a synod have all been recognised by the Eastern patriarchs themselves.

With a very few words more I conclude. It is said generally that Russian architecture is not original, and that it is a coarse and rude imitation of other work; but I assert that all the three principal churches of the Kremlin, particularly the Uspenski Sobor and the Annunciation, have a distinct and special character. And when we take the Church of St. Basil, which, although coarse, is one of the most picturesque works which I know of; when we look at the "Church of the Mother of God," and more particularly at another church of which I am enabled to show you a photograph.

I feel I may fairly lay claim for Roman architecture to very considerable originality, good taste, and artistic power. I am not sufficiently acquainted with the architecture of India to know whether as characterizing the Architecture of Russia the feeling which is manifested in these works is inspired by still finer works in Asia, but whatever the inspiration may be under which they were erected I feel that they are works of great merit and beauty.

Professor DONALDSON, Past President.—I rise to propose a vote of thanks to Mr. I'Anson for his elaborate and interesting paper. I do not know that there has ever been so minute a description of the different Russian churches from a professional man as that with which Mr. I'Anson has now favoured us, although we find in this quarto work of Dr. Lyall's that the buildings to which he alludes are very fairly represented. It appears that in the finest works there is a barbaric affluence of effect, and that much depends upon the colouring given to them and the conspicuous forms they assume. I should have been glad if our friend had given us—which he is so capable of doing—a little more of his opinion with regard to the distinctive features which he considers characterize Russian architecture, because, he says, there is mixed up with it so much of Italian taste, that there can be no doubt people of that country were largely employed in many of the buildings, &c., of Moscow. In like manner, some of the more recent fountains of Constantinople have been erected by Italians; and though, no doubt, presenting the leading features of Turkish design, still the works are essentially Italian in many of the details. Looking at the influence which Italian taste obtains in Moscow, it would be very instructive to hear something with regard to the peculiar features which would lead us to appreciate the individualities of the architecture of Russia. We must all have been struck with the vast size and conspicuousness of form of some of these buildings, and the great profusion of external ornamentation which renders them remarkable; but with respect to the distinctive features of the architecture itself, in some instances it appears to be confined to the simple forms of the mosques of Constantinople, and in the details to be influenced by the modern Greek taste. Referring to the drawing of the Uspenski Sobore Church, it seems to possess in a remarkable degree many of the features of St. Mark's in Venice. With regard to the peculiar building described as existing in the Chinese quarter of Moscow, it reminds me of the caravanseries of the East, where, the caravans arrived, the merchants displayed their goods, and thus formed a kind of bazaar; and the arrangements alluded to, I think, strongly favour this analogy. Mr. I'Anson has left nothing to be desired, except defining the peculiar distinctive features of Russian architecture.

Mr. I'ANSON, Fellow.—That is a most difficult question to answer. I do not know how to define the exact points which constitute the peculiarity of that or any other style, further than by comparing it with something else. The two drawings on the left convey more than any language of mine can do the peculiar features of the architecture. The domes which crown the Russian churches appear to be counterparts of those found in other parts of the East, more especially in Cairo; but there they are not grouped together, as in Russia. The foundation of the Russian Church is the Greek cross—one central dome and four surrounding domes. That is the abiding feature throughout every Greek church, and then those domes are always covered with cupolas. The domes of the Russian churches are not similar to those of the Turkish mosques, because they are more pear-shaped or onion-shaped. I do not know what distinguishes the Tahtar architecture, nor do I understand what Mr. Fergusson calls the Armenian dome. Very often the central dome of the Greek Church assumes the shape of a truncated spire, and near the summit it branches out; it enlarges itself, and on the top is crowned by a small dome. I cannot give the distinctive features of Russian ecclesiastical architecture further than that the churches have the form of the Greek cross—the large central dome, and four others surrounding it.

Mr. BASIL WHITE, Visitor.—I have no title to rise in this assembly, but I feel encouraged to say a word or two, having been in Moscow a month or two previous to Mr. I'Anson's visit; and if such masters of the art as Professor Donaldson and the author of this paper find it difficult to describe the peculiar features of Russian architecture, it is no wonder that I am not myself able to throw any light upon it. It was the question which I asked myself after having examined the architecture of Moscow, "What are its distinctive features?" I speak of the architecture of the town proper rather than of the churches which have been described this evening. It left the impression on my mind that there was very little style at all about it. Moscow, of course, has suffered severely from contraventions at many periods of its history, but Napoleon destroyed the features of the city proper, and carried his ravages up to the walls of the Kremlin; and though there are monasteries and other ancient buildings remaining, yet there is not in the city that peculiar character which one might have expected to find there. One advantage of the great fire in Moscow, as I was told, was, that it cleared the neighbourhood of the Kremlin of the dreadfully wretched streets by which it was surrounded, and it enabled the inhabitants to put up the buildings in that locality which we have heard of to-night. With regard to the embellishments of the interior of the churches, one can hardly describe the barbaric richness which characterizes them, especially the inconostases, which are covered with pearls and diamonds and other precious stones, with a profusion of richness one would hardly expect to find in a country like Russia. The features of some of the churches reminded me very much of the Church of St. Mark's at Venice. They are more analogous to that building in the peculiar semi-circular tympanums and in the domes; but I find the same difficulty which professors of the art have experienced, in describing, with anything like exactness, the peculiar features which distinguish Russian architecture from the more marked styles of Greece and Rome, and Gothic architecture, which are much more easy to describe.

Mr. W. Haywood, Fellow.—When I was in Russia, the architecture, which was much more than plain walls with openings in them, appeared to me the most closely to resemble Germanized Italian of a low class. The building at Moscow which struck me most—looking for something truly Russian—and which had the most distinctive architectural character, was the new palace; and although the composition is generally, perhaps, Italian in character, yet the ornamentation of it is of a peculiar character, and it had certainly a more special character than any other building I saw in Russia excepting some of the churches. I was told it was the work of a German architect. With regard to the Kremlin, the parts of the enclosure struck me as being somewhat Chinese in the character of their outline; still it was perhaps needful to look closely for the Chinese element beyond the towers, some of which have the outline of a Chinese pagoda; but there is in the Kremlin a spire of the Italian, the Turkish, and the Gothic styles, all mixed up in the most extraordinary manner. The general effect of the whole is charming. They were probably designed or repaired by Tartars. I have no recollection of anything so exquisitely picturesque as the view of Moscow from the Sparrow Hills under a shining sun; it was to me one of the most beautiful sights I ever beheld. It may be remarked, that there is in the architecture, as in everything else, a great monotony about Russia; the people look alike, dress alike, drive alike, and speak alike. The villages and houses are all alike, and all the churches are of the same form, although differing largely in size and in beauty of decoration. On passing the Russian frontier, you find the same five-domed church everywhere, and a thousand miles towards the centre they are almost identically the same. The iconostases are all more or less richly embellished. I was told that the value of the jewels on some of the pictures were worth as much as £50,000., and I should have guessed their value still higher. At the Troizka Monastery, the value of the jewels in the treasury are said to exceed fifteen millions sterling, and they are deposited there in such abundance that they are kept in the treasury in sacks and boxes. This vast accumulation of jewels is said to have resulted from the practice of devout persons on recovery from illness, or upon other occasions, sending offerings of precious stones. I believe that most of the churches in Russia are mines of wealth, irrespective of accumulated jewels, and I indeed heard it stated by a Russian gentleman, that the jewels in the churches in Russia are worth from fifty to sixty millions sterling. With regard to art in Russia, I never saw anything worthy of the name there, except the pictures, to which allusion has been made (some of the heads of those are very beautifully painted indeed), and perhaps a little good wood carving is done, but there is a large quantity of coarse monkish wood carving; there is also some silver ware, the ornamentation of which is eastern in character. With regard to the great bell, Mr. I'Anson must have estimated the height up to the shoulder only. I estimated the height to be about 30 feet, that was measuring from the lip to the top of the cross, and at the fracture the casting was 1 foot 2 inches in thickness. [At a subsequent period of the discussion I said, the Russian Church in the Boulevards at Paris, and the chapel not far from Wiesbaden, were the exact type of Russian churches; but, although they were beautiful in detail, they were designed, the one by a Frenchman, the other by a German, although Russians may have been engaged upon them.]

Mr. CHARLES BARRY, Vice-President.—I have great pleasure in seconding the vote of thanks which Professor Donaldson has proposed to Mr. I'Anson, who has taken us into new regions, and I have no doubt excited a desire to visit an interesting country hitherto almost unknown to any of us. But I would ask him whether a building, with which many present are no doubt acquainted, is a fair representation of Russian architecture, and that is the new Russian Church in Paris? If it be so, I think each one may pretty well answer for himself the question which has been put with regard to the distinctive characteristic of Russian church architecture. The treatment of that church struck me as evincing a great deal of delicacy and refinement of taste, which is hardly to be described as barbaric magnificence. The paintings, the mosaics, and the embossing which decorate the interior, shew these qualities in a high degree, and I was told that they were all executed by Russian artists brought to Paris expressly for that purpose. If that were so, it shews that the Russians are capable of executing works which, in point of colouring and form, are certainly not to be described as Chinese, or so inferior as those other styles which have been alluded to, but which are deserving of a somewhat high place in art. The pictures are for the most part admirable, and the expression of the features is very beautiful and exact; and I should like to ask Mr. I'Anson if we may take this church in Paris as a faithful exemplar of the mode of decorating the Russian churches.

Mr. I'ANSON.—I should say the church alluded to is an extremely refined and advanced example of the ordinary Russian churches. There is a little chapel on the Nicholas Bridge, which is a beautiful work of art, and there are two others on the side of the [Gate of our Saviour], which are just being finished, both being works of great beauty and much in the style of that at Paris, which, as I have said, is extremely advanced and transcendently beyond anything which I saw in Russia.

Professor DONALDSON.—With respect to one class of art, the Russians may be said to be supreme. I mean mosaic decoration. Many present will recollect the magnificent example of this art which appeared in the French International Exhibition last year. It was of enormous size, but unfortunately it is intended to be placed over a doorway, the head of which cuts into the composition. The figures were finely composed and well drawn, and the splendour of the colouring, with the brilliancy of the gold ground, produced a magnificent effect. It will also be recollected that in our own Exhibition of 1862, there was a very fine mosaic displayed in the Russian Court, and it is a class of art in which they are eminently successful.

Mr. E. COOKE, R.A., Visitor, expressed his high admiration of the work alluded to by Professor Donaldson, the tones of the picture being extremely charming. He thought, however, that the design was more German than Russian.

The CHAIRMAN in putting the resolution of a vote of thanks to Mr. I'Anson, remarked that the door had now been opened to a most interesting subject, which he hoped would be reverted to on a future occasion. The vote of thanks was unanimously accorded to Mr. I'Anson for his Paper.

BIOGRAPHICAL NOTICE OF F. T. FISCHER, OF BADEN, HONORARY AND CORRESPONDING MEMBER, DECEASED 14TH NOVEMBER, 1867.

Translated by C. C. NELSON; from the *Carlsruhe Times*, of 26th November. Read at the Ordinary General Meeting held on Monday, 20th January, 1868.

THE Baden Architectural world has to lament a painful loss in the unexpected sudden decease of the Grand Ducal Baudirektor Fischer. To high endowment, much knowledge, rich experience, strict integrity, he united a rare power of purpose and of execution. He devoted his life to his profession, and the State lost in him one of its most zealous servants.

Friedrich Theodor Fischer, born 8th September, 1803, at Carlsruhe, prosecuted his professional studies in the school of Weinbrenner, and in the Ateliers of Huyot and Gau, in Paris. In 1826, he passed with distinction the Baden State Examination, and forthwith undertook more extensive professional travels through Germany, France, and Italy. His letters of that time are written with poetic feeling and inspiration; and the rich treasure of drawings, which he brought home, bears testimony of his untired, aspiring, artistic activity. It was not till later that he was permitted to visit England, Belgium and Spain. After his return from Italy, in the year 1833, he was appointed to the Heidelberg Bauinspektion, and at length raised to be Baudirektor in 1864, the highest post in his country. He designed and executed more than thirty Evangelical and Catholic Churches, for country parishes and small towns; various parsonages and school-houses, corporation and town houses, custom-houses, prisons, hospitals, baths, private dwellings and villas, &c. The enlargement of the Carlsruhe Polytechnic; the School for manufacturing Machinery; the Lyceum; the Anatomical and Lying-in Hospital in Freiburg, the town house in Tauberbischofsheim were his last more important performances. The ornamenting of the so-called new Castle in Baden, a part of the old Castle Eberstein, the alteration and finishing of the Palace of her late R. H. the Grand Duchess Sophia evince fine artistic feeling, and considerable talent for decoration.

In 1854, the Directorship of the Carlsruhe Bauschule was transferred to him, in which post he laboured usefully, with never-resting zeal, crowned with happy results.

By his late R. H. the Grand Duke Leopold, he was decorated with the Order of the Baden Lion; by the Carlsruhe and the Swiss Architects' Union, he was made an Honorary Member, and in 1865, an Honorary and Corresponding Member of the Royal Institute of British Architects.

Last September he visited the Exhibition in Paris, from which he returned apparently in good health; but in a recent official journey, he caught a cold, to which he at first, being accustomed to exertion, paid little attention; but which subsequently changed to the painful illness from which he never recovered. He sank under its effects on November 14th, 1867.

30, Hyde Park Gardens.

Friday. Feb 22. 1867

Messrs Day.

Be so good as to let me know the cost of printing 200 of the Barry Meml. Subsn. List (150 to be folded for envelopes).

There may be a very few addns. to the present type. I wish to make the Balance Sheet Statement quite correct.

Yrs faithfully

Chas. C. Nelson

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 3rd February, 1868, C. BARRY, Vice-President, in the Chair, the following Paper was read :—

PECULIARITIES OF DOMESTIC ARCHITECTURE IN AMERICA,

By GERVASE WHEELER, Fellow.

A STUDENT of architecture travelling in America, although not finding subjects of æsthetic value for his note book, such as he would glean from the art treasures of an older world, may, nevertheless, remark many things worthy of investigation and remembrance. An examination of the domestic architecture of America especially will well repay the time spent therein, and upon this subject principally I would respectfully claim attention. I should first remark that the public buildings, many of them large and substantial, do not differ from similar structures, such as may be found at home ; in these the architects have had things pretty much their own way, and must be answerable for the results ; but in the private dwellings individual tastes and national characteristics have made their mark, and consequently an American's home differs in very many points from residences in London or in Paris. The churches depart only in plan and internal arrangements from their European types, their architecture having no especial marks of novelty ; Trinity Church, New York, the Cathedral, as it is sometimes called, of Episcopacy in the United States, is a fair example of a large building of the perpendicular period, and as good as revivals of our own of about thirty or forty years ago,—better, indeed, in many respects than most of them. The other costly churches of New York, Boston, and Philadelphia, are many of them very well designed and admirably built, especially comfortable, too, in their sittings and appointments, but they have no national difference to stamp them as American, being English or German, as the architect employed happened to have come from either of those schools, and reproduced on the other side of the Atlantic the traditions of his office, or the bias of his art education. I think it may be admitted, especially by those who have travelled through the States, that there is nothing in public buildings there to show the dawn of a new development, and that in American domestic architecture must be sought the germ of a national style, if such a flower is ever to bloom on transatlantic soil !

I have sought very closely to determine wherein American domestic life differs from our own, because I think that it will be conceded that in the effort to meet the requirements of living, all structural forms must acquire shape, and the only honest building is that which supplies what its inmate needs in the most admirable manner. Now, American life differs, it seems to me, from ours mainly in this, that it is social on a much larger scale, and that it is far more comprehensive in its domestic machinery. The result practically is, that the houses are all very much larger, the rooms of great size, and the appliances and arrangements, to save labour to servants, are most important features in the plan. Add to these the local influences of climate, and an architect may plainly see what demands he has to meet in successfully designing an appropriate American home. But with all the advantages he may have gathered here, I will venture to say that the actual building, such as he will see by the thousand in all the large cities of America, will show him much wherein he may learn a useful lesson, not without advantage in its application here.

Such of you, gentlemen, as have visited the United States, will I am sure agree with me that the approach by the sea to either New York or Boston affords a view of magnificence of scenery not to be surpassed by anything else of its kind in the world ; but probably the first impression made upon the stranger will be that which I think he will retain to the very last as the striking peculiarity of America, namely, the wonderful brightness of the atmosphere and the enormous distance to the zenith. It is important to remember this, as very much of the effect of American architecture is due thereto. The sombre colour of the New Jersey and Connecticut free stones, of which the buildings are generally composed, would be heavy and gloomy in such a climate as that of England, whilst, on the other hand, the brilliantly white marble and vividly vermilion bricks that are also used, would be out of tone in a lower atmospheric key. The flashing reflections of the bright tin roofs (not so common now, however, as they were fifteen years ago) strike, on first sight, with peculiar distinctness; and such is the dryness of the atmosphere, even by the sea-side, that these roofs are durable in a remarkable degree. The mode in which the tin plates are laid allows for contraction and expansion in extremes of heat and cold, such as the climate of the Northern States presents. The great advantage of a tin roof is its lightness, and the ease with which it can be laid and repaired; the heat more or less caused by all metal coverings is guarded against by a non-conducting substance placed between the roof boarding and the tin, generally felt, and sometimes sheets of cork, or cork bark. Slates are, however, very largely used now, and the French *mansard* roofs are becoming quite numerous.

There is a strong dislike in America to a parapet and inside gutter, caused by the difficulties arising from the sudden and enormous falls of snow and the accumulation of ice, and the great practical difficulty is in getting rid of the roof-water in a sightly manner. This necessity causes one of the most marked features of an American town residence, namely, its very large and far extending cornice, which in fact is really only an enriched gutter supported upon brackets, and having the water led therefrom into down pipes of very large size. In country houses the eaves are extended considerably beyond the walls, three feet or more, and are generally made without gutters, allowing the water to shoot beyond the building, often dripping into a conduit formed in stones, tiles or bricks upon the ground, and carried around the house. Thus the first striking feature of an American town house is the cornice, and an immense variety of embellishment may be seen therein. Our workers in cement or artificial stone would run riot in New York, but to the credit of American builders, it must be stated, that artificial materials are very little used, and solid stone, brick or iron are thus employed.

The buildings are high, but as generally they have more frontage than with us, the proportion is not lost of each separate composition. The worst effect is in the irregularity of height and design in buildings of the same size and class in the same row, but after all this, want of uniformity is not much greater than may constantly be seen here. It is not usual to see two or more houses alike, each occupant generally has built for himself, and has consulted his own taste only; and even when builders put up houses to let or sell, they are not fond of making one building the counterpart of its neighbour. Blocks of houses of similar design may here and there be seen, but they are exceptions, and only serve to prove the rigour of the rule, "each one for himself."

Next to the cornice, the entrance doorway is a feature sure to attract notice. This is invariably high and wide, and elaborately embellished; in all cases consisting of wide outer doors and an inner vestibule of marble, or inlaid tile flooring, and approached by a wide and high flight of steps. The old name of "stoup" is still retained for this feature, the top landing before the threshold of the door being so wide, and the cornice or cap over the door projecting so far over as a protecting shade, as to form a "stoup" or open porch, such as the Dutch ancestors of old New York delighted in in older times. This is the genuine New York house,—the "high-stoup," in contradistinction to which, a comparatively modern innovation, that in which the ground floor is nearly on a level with the pavement, is called an "English basement house."

Beneath all these houses are very spacious and lofty sub-cellars, in which is the furnace or hot water or steam apparatus, which warms and ventilates the whole building. Next above this, and in the "high-stoup" but little sunk below the level of the pavement, is the basement floor, comprising the usual living room of the family in front; in rear of it very large and well-arranged china closets, pantries and serving room, and behind the kitchen, continuous with which is the laundry, supplied with fixed washing troughs of most admirable construction; the whole spacious and well lighted. On this floor also will generally be found a servant's bath-room and other conveniences, and always the lift or dumb waiter, leading to the floors above. The size of these houses is invariably regulated by the fixed frontage of a "lot," which means twenty-five feet by not less than one hundred feet in depth; buildings are therefore on one, two, or more lots, as the case may be, sometimes three upon two lots, and sometimes even two upon one lot, that is, with a frontage of only twelve-and-a-half feet where land is too costly for a full front. The houses are always of considerable depth, and upon the principal floor an extension is generally carried in the rear, across the whole width, giving an additional room. With us the great difficulty would be to obtain light to rooms so deep, but here the American clearness of atmosphere renders aid, and as the storeys are lofty, and the rooms unbroken by cross partitions, other than columns or wide sliding doors, filled with plate glass the full height of the rooms, a sufficient distribution of light is gained. For party-giving conveniences commend me to a New York house, and for comforts in the sleeping apartments, for spacious bed rooms, large dressing rooms, with bath rooms close at hand, the same are unsurpassed; but for quiet home life something more cheerful than a basement sitting room, and less pretentious than the spacious and splendid *salons* of the floor above, would be sought as models to be universally adopted. We have, however, nothing in England like the average American town-house, of moderate cost and size.

The style chosen for these structures is as whimsical as individual taste can select or contrive. Severe purity of any kind must not be looked for; here and there a fair Italian façade may be seen carried out without violating respected canons of art, and yet, although much vulgarity of taste, resulting in overcrowded ornament and incongruous elaborated details may of course be seen, I do not, on reflection, remember anything really offensive to the eye in most of the costly residences of New York or her sister cities. At present the great want is of a real meaning in the embellishments so lavishly thrown upon the buildings, though it is pleasant to note the conscientious efforts made by a few native architects to bring about the commencement of a national style, by the adoption of national forms in their designs for architectural decoration. The new Academy of Design in New York is notably an example of this, and in many a princely mansion in the upper part of that costly city may be traced evidences of some thoughtful care to give an American expression to familiar details. The German element is largely shewn in architectural design, and not, I think, very happily or judiciously; something in the bright climate seems to call for a lightness of design more easily to be met with in our modernized Italian, or even something suggesting an Oriental flavour in its finish and refinement. American architectural art is in a transition state, but from its domestic buildings is, I fully believe, the embodiment of some fixed principles of design to spring.

Praise can conscientiously be given to the *real* nature of the embellishments employed. The internal woodwork is generally of hard wood,—oak or black walnut, maple or yellow pine, polished; graining upon deal in imitation of other woods does not find much favour, and the work throughout is generally of an honest and substantial character. The stairways are always wide, and the balusters and handrails have more importance given to them than is the custom generally with us. The lavish supply of water to all parts of the house is a notable feature in American houses, consequently the plumbing is a very important item in a contractor's estimate, often, in fact, forming quite one-fifth of the whole cost. In a climate so severe in winter, of course every precaution has to be taken to guard against frost, so the pipes are laid in such manner as to let the water run back when the pressure is removed, and by opening a safety cock at the junction and closing the union attached thereto, every night, all pipes are emptied. Another mode, where the occupant is unwilling to have the supply interrupted during the night, is used, by which the pipes are so arranged as to secure a constant but moderate circulation. The pipes are never buried in the walls or partitions, but are all displayed in sight, and being handsomely mounted on polished or painted strips, and with furniture almost invariably plated, they are rather ornamental adjuncts to a house than a disfigurement. I have heard many English tradesmen say that the plumbing and painting of the good houses of New York and other towns are superior to what they had been accustomed to at home, and few that have visited the country but have returned with new ideas. The supply of hot water to bath rooms and dressing basins is almost invariably on the low pressure system. The usual mode is to provide a coil of iron pipes around the inner side of a very large upright copper boiler, which is connected with the water-back of the kitchen range, or in some very large establishments has a fire-place of its own; through this coil the water circulates and rises to the required levels. I would remark that these boilers are of large size, cylindrical and of capacity of from thirty to one hundred gallons, and also that the fuel employed is anthracite and not bituminous coal, which not only gives a greater degree of heat but keeps the flues much freer from fouling than the kind in ordinary use here.

I have alluded to the superior arrangements provided for washing; these consist of three or more wooden troughs, deep and wide, and with hinged lids to close when not in use. Each of these has a tap for hot and cold water, the former obtained from the large upright boiler before described. A waste pipe with trap leads from each. An ironing table of very convenient and novel design is in frequent use. This has a large square moveable top, hung between standards (like stall ends), which forms a table when required, and the back of a settle when out of use. Between these ends is a box for linen, the top of which forms a seat; and thus when the back is shut down a very comfortable piece of kitchen furniture is obtained. Of course these houses are well provided with bells, speaking tubes, dumb waiters, and the like; these appliances in no way differ from what may be seen here, excepting in their far more general and liberal supply.

The houses thus briefly sketched are the ordinary moderate-sized residences of the citizens; better indeed than such as are to be had in good neighbourhoods here, but costing more considerably than our own. All the large towns abound with mansions that exhibit every luxury and extravagance wealth can supply, and which in point of size and lavish architectural decoration can compete with the grandest modern residences of London or Paris; but it is not fair to consider these as the ordinary houses of American families, and they are not in themselves interesting as a class. The house of moderate size, such as every dweller in a town needs, is the example I have had before me in these brief remarks on American domestic architecture; and when it is stated that such buildings may be seen erected more than twenty years ago, each one as complete and as spacious as those now rapidly rising in the new parts of New York, I think the Americans who come over here may fairly boast of being housed in a manner far beyond what present experience can honestly claim to be our own lot here.

The building materials in use in America differ in the several States. All are well supplied, and the city of New York is in reality one vast stone quarry, so that in the upper part the excavations for foundations have to be blasted out, and the stone removed is frequently well adapted for building purposes. The immediate neighbourhood abounds with marble, and the opposite State of New Jersey has abundance of a beautiful fine-grained freestone of an excellent quality. The Americans are also very fond of using a building stone from Nova Scotia, a stone very like our own Robin Hood. Timber is of course to be had without limit, and, in consequence, the frame of a building is usually of heavy scantling. The floor joists are generally deeper than with us, and joiners prefer bolting thicknesses together to form girders, breastsummers, and lintels, to forming them out of the solid. Some of the timber-framed roofs and bridges are well worth an examination.

The bricks used are generally of excellent quality. In Philadelphia and Baltimore a red brick is made, of great beauty and durability, pressed by machinery, and remarkably true and well formed. In Milwaukie and other places in the West a yellow brick is made of very great hardness; the same clay being also capable of being moulded into any usual form. All American bricks are smaller than ours, being but eight inches in length, so that the walls differ in thickness from our own in this proportion.

In the country wooden buildings are still very common, and much may be said in favour of a well-built timber house, when material is so abundant and so rapidly and handily employed. The mode of building is to cover a frame with rough boards externally, and then with clap-boards, as they are called, which are boards planed by machinery, one end worked down to a feather edge, and laid so as to allow the thick edge to lap well over the other. Another mode is to use upright planks placed against each other, and a batten over the joints. The frame is usually filled in with soft or place bricks, half a brick thick, or sometimes with coarse plaster, and the whole is lathed and plastered internally in the usual way. These houses are very warm and durable, and being rapidly and economically erected will long be used in a country which requires houses for an increase of population so speedy as to forbid delay in housing them.

All the applications of mechanical art in use here in the embellishment of buildings find favour in America. Minton's and other makers' encaustic tiles have an enormous sale, and artists find ready employment in painting walls and ceilings. Paper as a wall hanging is much less frequently employed than with us; in fact, a few years ago there was so strong an objection to its use that owners of houses used to forbid its application by tenants, even at their own expense. A peculiar mode of plaster finish, called "hard finish," is commonly adopted, and consists of rendering the last coat in fine plaster and marble dust carefully floated. This dries with a very hard and almost polished surface, and, whether left a pure white or as a ground for painting, gives a perfectly smooth and clean face. Enamel white is often used for all the woodwork, and the surface is by this means brought up to a beautiful gloss and hardness. For bedrooms the above modes of wall and woodwork finish are well adapted; the rooms are easily kept sweet and clean, and as the sleeping room has fewer large pieces of furniture than with us, the dressing tables, wardrobes, and washing stands being always provided in the dressing closets invariably attached, a better ventilation is obtained. The plan of the sleeping floor of a good New York house is as nearly perfect as possible; and if, to what the builder has provided, an English housekeeper would add some of the snug fittings which our own habits require, the result would be absolute comfort.

It will, I hope, by these remarks be seen that the American town-house is almost *sui generis;* it is not French, nor is it English, although possessing features common to both countries; and if the newly-acquired wealth of the citizens leads to some vulgarity of display, I do not know that we can afford to say much in the way of censure in face of examples we can call to mind at home.

The rural homes of America show a decidedly English parentage, and although externally often partaking of the most whimsical characteristics of ancient or modern European styles, internally the convenient arrangements and the sedulous attention to domestic requirements prove how much the traditional home teachings of the mother country have been respected. Twenty years or more ago the country houses, springing up with almost miraculous rapidity throughout the length and breadth of the United States, afforded a most interesting study; Americans could not wait to theorize, but had to act,—and the avidity with which any sensible idea was caught up, and the enormous success of any practical architectural book that offered directions *what* to build, rather than *how*,—were marked proofs of the earnestness of the people in their search after good models and good advice. The late Mr. Downing had led the way by his graceful and eminently useful books on country residences and country practical life, and the ready ingenuity of the people found ample scope in fitting every possible comfort, and contriving every possible aid to domestic labour, to as picturesque and varied an exterior as their own taste or the skill of the builder could supply. Architects were not so numerous then as since, and a very large proportion of country houses was necessarily erected without their aid, although, to the credit of the Americans, it must be said that every effort was made to obtain professional advice, and when obtained it was most scrupulously and confidingly adhered to. A memory of many years spent in professional pursuits in America justifies this conclusion, that the smaller type of country house, such as would correspond with our villa here, is in all its internal arrangements superior to a house of similar class with us.

The exterior has features made requisite by the climate, which, when honestly carried out, give an American country dwelling a character of its own, and thus afford a means of contrast to ours which artistic skill readily may take advantage of,—I allude to the necessity for providing protection by means of wide verandahs—deeply projecting roofs, and the like, from the great heat of summer. The verandah was frequently made even more than a cover to a walk or terrace, or, as with us, perhaps only to a window; it was carried often beyond the building, so as to form a pavilion or room out of doors, and became of such common occurrence as to receive a distinguishing name, "*Ombra*"—a term adopted by American architects, and originating, I believe, with myself,—to designate this well recognized feature. Thus American country houses are generally provided with open porches, verandahs, ombra, and the like, which project from the main lines of the building, and afford an opportunity for effective treatment in the hands of an architect.

In stating that the smaller rural home can fairly claim on the average a superiority to our own internal arrangements of similar houses, I do so with deference to the natural feeling of confidence in the skilful planning of our own buildings, and I have, perhaps, but a limited acquaintance with such buildings here. Taking, however, those such as any one may see in suburban neighbourhoods,—houses worth from six hundred to two thousand pounds, and contrasting them with houses of corresponding class in America, I find that the following points of superiority force themselves on my attention—

The American house will almost universally have a principal and a secondary staircase; the rooms will be more lofty; the kitchens and domestic offices larger; bath rooms, lavatories, and dressing rooms will be more generously provided; store closets, dressing closets, wardrobes, much larger and more airy; more liberal provision of speaking tubes, lifts, dumb waiters, and the like, for the convenience of domestic service, and invariably larger and better-arranged sleeping rooms, bath room, and similar comforts for servants.

In all these points the Americans are particular; and without claiming artistic superiority in the design, I do believe the planning of houses, such as men can most comfortably live in, received at the time I speak of more attention than we can safely say was the case here. Perhaps a simple explanation may be found in the fact that at that time the trade of a speculative builder, excepting in the large cities, was almost unknown; each house was built for an individual want, and received individual attention; every man was more or less capable of saying what he looked for in his house, and the Americans (as I have more than once remarked,) being very ingenious in all labour-saving appliances, the adaptation of the interior to ordinary domestic life received much attention. I do not think at that time the services of an architect were so much called in for houses of moderate size as were books consulted that gave illustrated designs; plans were carefully conned over and altered by the intending home-founder, and with these to show what the arrangements of the floors were wished to be, a builder generally supplied the rest. Downing's books were in great demand, and others of somewhat similar character (which it would not do for me more particularly to allude to,) showed by their rapid sale how eagerly information on country-house building was sought. Had Professor Kerr's 'Gentleman's House' been published at that time, it would have found in the United States (unless unhappily republished by some 'cute speculator in American form,) a circulation that would have delighted its author.

One peculiarity occurs to me in the plan of nearly all these houses of moderate size;—the dining room was more nearly connected with the kitchen than with us,—always a serving room between, but never separated by a staircase or passage. The hot cakes, so important a part of an American breakfast or tea, were too carefully thought about to allow them to be chilled by passage across a hall or vestibule! Looking over a number of plans now before me I find this feature always present, and notice that in the serving room or pantry was generally a hot closet, turning on a pivot, and allowing the dishes to be passed through from the kitchen without any odours of cooking finding their way into the room. I have a very grateful recollection of the comforts of these contrivances, and of the excellencies of an American country breakfast and tea—which latter was really a late dinner, without our own formality. The interior of these houses usually shows a refinement of finish that, I venture to say, will surprise an ordinary English visitor. It is in their country houses that our American cousins show to greatest advantage; and the great number of books that have been written upon country life by American authors is worthy of some reflection. Americans, it must be remembered, are an intelligent and quick-adapting race; they are, moreover, fond of travel, and very few there are at the present time who have not made themselves well acquainted with all the notable places on the continent of Europe, and still more diligently have explored all the nooks and byeways of England, as well as the more beaten tracks of travel. I am sure I have learnt more of some of my own counties from American note books than my nationality makes it altogether pleasant to admit, and I have found lessons stolen from our own bright happy country homes, and well applied in America. It will not do to imagine Americans dwelling in the bare square boxes that twenty years ago writers described their villages to consist of. Improvements have been most rapidly introduced, and memories of all that was noteworthy in other countries have been applied on each traveller's return, so that we have scarcely an advantage, excepting that of greater age over our transatlantic friends.

The moderately sized home of an American family is rarely other than an exceedingly comfortable one; and if some oddity of external embellishment provoke a smile, the thorough manner in which the requirements of domestic life have been carried out and provided for deserve praise. The grounds around such houses are generally very attractive. Landscape gardening has many able professors in America, and is a favourite pursuit. The press is full of works on such subjects, whilst magazines devoted to horticulture, and to all pertaining to life out of doors, are in great demand. Americans, as is well known, are not fond of out-door pursuits, except that of driving; but there is a very marked improvement in their taste for gardening. They are somewhat less inclined to wait the gradual development of artistic ideas than are we; and an American home-founder, as soon as he has settled upon where his house is to stand and what it is to be, is generally impatient to see the perfected whole in rapid growth. Levelling, turfing, road-making, and all the mechanical portions of laying-out a country place are pushed forward with most commendable celerity, and the result, in their wonderfully productive climate, is generally in every way satisfactory. They especially excel in their mode of removal of large trees, so that the formation of plantations is comparatively an easy matter. Their mechanical ingenuity, too, is shown in all practical details by which labour may be saved. I remember, in one instance, where a large extent of lawn had to be provided, the ingenuity of the land steward contrived an impromptu turf-cutting and laying machine, which was most admirable in its practical working.

I ought also to remark that in many sanatory arrangements Americans are more generally thoughtful than we are. The small country houses always possess a system of independent ventilation, and the water closets and sinks discharge into cesspools, which invariably have an airduct communicating with the kitchen or furnace flue. In grounds of sufficient size the excreta of the house are carried into tanks, and used for manurial purposes. In all that I remember a liberal water service was arranged and carried all over the building.

It will thus be seen that in all the essentials that in house planning and building go to make a home, Americans deserve to be well spoken of; and that the artistic expression will assume a commendable form in proportion as the canons of art are recognised and respected. Architectural societies may and should do much, and it is to be sincerely hoped that the attempt will be to work out principles instead of forms, and that the American architect will strive to learn from the art lessons of the Old World wherein the excellence of their examples consisted, rather than strive to exactly reproduce what in other climates and under other exigencies the skilful hands of the past contrived.

The large houses or mansions of America, such as were built some years ago, more closely followed European types. The plans of many of them, particularly of those erected in the Southern States, were obtained from this side of the Atlantic, and I do not remember anything peculiar or noteworthy about any of them, excepting the size of the rooms, and the ample provision of verandahs, colonnades, and other shade affording external features. Now the rich Americans are building mansions of enormous size—hastily built, and not so substantially finished as our own, but with very costly fittings, especially in plumbing and heating arrangements. Society in America is in a transition state, and, as we all know, it takes more than one generation to mature the finished, harmonious family home like that of the English gentleman of wealth and cultivated taste.

In one respect our American friends have something to learn from us;—good as the houses generally are, the adjuncts thereto are not as carefully provided for. The outbuildings are rarely so compactly arranged or decently contrived as may be seen at home;—I do not speak of farm buildings and such like, which certainly are often large and well contrived, but of the necessary addenda to a country establishment, the stables, laundry, and the like. With us these are very properly made features of the general design, and the result is an appearance of permanency and of self-contained home comfort altogether admirable, as American writers on English country life very cordially testify.

The roofs of these country buildings are rarely so much broken up as with us; the enormous and sudden accumulation of snow in the winter makes builders careful to provide even slopes and unchecked lines of descent, hence valleys and dormer windows and multiplicity of gables are as much as possible avoided; nor do Americans affect much variety in the way of pinnacle or ridge cresting, although such features as campanili and spirets are common. Towers and observatories are freely used, are generally large and serve a useful purpose. Many examples occur to me in which the upper room of the tower was sufficiently large to contain a billiard table, and was used for that purpose. The plan of nearly all American country houses affords a wide spread upon the ground; halls and passages are always wide, and, as before remarked, the rooms are large; the kitchens, &c., are rarely below the ground level, and the large space of cellarage beneath is occupied by the heating apparatus, fuel, and the like. In one residence that I remember, after amply providing for all these, there was sufficient space left for an American bowling alley, and in another for a museum of natural history and geology.

I trust, gentlemen, that this brief sketch of recollections of domestic buildings in town and country may serve to show that Americans have made rapid and commendable progress in all that pertains to internal comfort and to the conveniences of practical home life. I have purposely said but little upon the artistic expression of their architecture, partly because without numerous illustrations the subject would be unfairly viewed, and because Americans have scarcely yet reached a positivism in expression sufficient to give their designs individuality. An interesting problem remains for our transatlantic professional brethren to work out; much progress has undoubtedly been made, and I cannot close without recording my individual belief that it is in her domestic architecture that America may be expected to develope a national style.

The CHAIRMAN (C. BARRY, V. P.), said—Mr. Wheeler has opened to us a subject of great interest; and I have no doubt there are many gentlemen in the room, who, though perhaps not prepared to discuss it at the moment, may wish to ask some questions by which some further information on matters of practical detail may be elicited.

In reply to inquiries by the CHAIRMAN, Professor DONALDSON, and other gentlemen,

Mr. WHEELER stated that the usual height of the floors in ordinary houses was—on the ground floor, 13 feet; and in the bed rooms never less than 11 feet. The family washing was almost universally done at home, hence the complete arrangements in every house for that purpose. In reference to the statement that the dining or living room of the family was on the same floor with the kitchen, with convenient communication with that apartment, Mr. Wheeler remarked, that as dining was not so much an institution in America as with us, the living room was always on the same floor as the cooking apartment. They went down stairs to it, and the cellars were below that. The principal advantage in this arrangement was, perhaps, in the saving of labour to the servants; and it gave a large and open suite of rooms above for social purposes. Another reason for that arrangement was, the owners of the houses were generally engaged in business in the city during the day, and there being great difficulty in getting servants, the family were desirous of having the domestic arrangements of the house as much as possible under their control. When the owner of the house came home after business, the family assembled on the ground or principal floor, where the domestic arrangements of the basement were no longer required. The system of party-giving in America differed very much from our own. The guests were satisfied with a very moderate amount of refreshments, which consisted generally of ices and confectionary, and at most, oysters dressed in various ways. He had been present at large parties, at which nothing but ices were served. Owing to the large scale on which the houses were built, and the extensive domestic arrangements introduced, it was a common custom for families to receive other inmates and boarders, which enabled them to occupy larger houses than they would otherwise, and rendered spacious rooms necessary.

Professor DONALDSON, Hon. Sec. For. Corr.—I rise to propose a vote of thanks to our Fellow Mr. Wheeler for the very interesting and instructive paper he has favoured us with this evening. There is a great deal of intelligence in this communication; it opens one's mind, and induces one to think and revolve in the memory the practice both in America and in our own country, and we may learn something thereby. I should be very glad if Mr. Wheeler will favour us with a plan or two of American houses, as a supplement to the very able paper he has drawn up, and I have great pleasure in proposing a vote of thanks to him for it.

Professor KERR, Fellow, said, I have great pleasure in seconding the vote of thanks. I have listened to this paper, and to Mr. Wheeler's subsequent explanations, with great interest, for two reasons:—first, because many years ago I spent a short time myself in New York, with the intention of settling there; and, secondly, because the subject of the paper is one to which I have specially devoted myself, namely, domestic architecture.

It seems to me we may explain a good deal of what Mr. Wheeler has pointed out as differences between the American system and our own, upon principles comparatively simple. The city house which he has described in such glowing colours is more than anything else an imitation of the Parisian house—certainly an American imitation of it, but more French than, for instance, English; and when it is said that New York mansions are superior to London mansions (of the average, of course), it is merely because there are certain conditions attaching to London, which regulate the plan of London houses of the highest class to their prejudice.

It is, however, when we go into the country in America, that we find ourselves in a state of things, as compared with what prevails in the country here, which is more interesting in respect of those differences of plan which Mr. Wheeler has hinted at. Let me for a moment classify English houses. Passing by the cottages of the lower classes, and also those houses which are places of business, we have two distinct kinds of country dwellings, the origin of which, in both cases, is historical. The one class is the *Farm House*, the other class is the *Gentleman's House.* And I may at once say that as our farm house is the original type of the country house generally in America, so it is the same farm house which is that of the gentleman's house in America. I am told by an excellent authority on such a point, who has only lately passed over a good deal of ground in America, that I am quite right in saying that a gentleman's house, in the English sense of the phrase, is scarcely to be met with in the length and breadth of the land. Now the English farm house is based in all its arrangements upon the idea of the operations of agriculture being carried on from the house as head quarters; and one consequence is, for example, that a peculiar necessity arises for the close contiguity even in the best houses of the dining room and the kitchen, because the servants of the house have other duties to perform than mere domestic service. But the gentleman's house of England is a thing of an entirely different principle. It dates back from a remote period; we are able to follow it in its details down to the present day without interruption (except that which occurred in the last century by the partial introduction of the Palladian plan); and the requirements of the family and the servants respectively are almost identical now with those belonging to the fifteenth or sixteenth century. The consequence is that a certain type of plan has grown up and become established, so that it cannot be deviated from with propriety. Now this depends upon elements which never existed in America, or rather, I ought to say, certainly never in the Northern States to any considerable extent, although possibly in a modified form—and in fact a very different form—in the South before the abolition of slavery. The point I especially refer to is the separation of the two classes of persons—the family and the servants, who are the occupants of the house. It is a radical fact with us that the family are a superior class of persons—the servants an inferior class (and yet in no way like the bondsmen of the old South); and that each class shall be provided for on its own ground in its own way; the family to be waited upon, and the servants to wait upon them; and that the servants' accommodation should have no connection with the family accommodation, and yet be so placed as to facilitate to the utmost the service of the family. It therefore stands to reason that such conditions should cause corresponding pecularities in the plan of the country houses, and that amongst other things there should be produced that one peculiarity which places the dining room, really a *salle à manger*, in close contiguity with the kitchen or cookery. Again, it is doubtful whether in respect to their own locations and surroundings there are in America any country houses, in the sense of landlord's houses standing in the midst of large freehold estates let to tenants. The nearest approximation is the farm house on a large farm, as the model "country house" of even a wealthy man; the only other "gentleman's house" being the villa, a few miles from some metropolitan centre of business, and accommodating some one engaged in daily trade.

Another thing which affects the plan of private houses in towns is the almost universal system of living in hotels and boarding houses, even on the part of the more wealthy classes. It is even the practice among the common middle classes for visitors to a family to pay so much a week for their board. This illustrates what the peculiarities of American living are, which of course give rise to such peculiarities in the arrangement of houses as Mr. Wheeler has adverted to. The question of American architectural style is one of interest to us all, though it does not seem desirable to go into it to-night; yet it might be very profitably speculated upon, and especially now that technical education is becoming with us a political question. Our American friends seem to have educated themselves in respect to style upon mainly two exemplars,—the one the English practice, and the other the French. Our friend Mr. Ware, of Boston, who so recently favoured us here with a paper on a kindred subject to this, told me, on his return from travelling over a considerable part of Europe, that he was more struck than ever with the decided preference which Americans must necessarily feel for the English models, and that it was plain there was comparatively little to be had, even in Paris itself, suited to American architecture. To come to details, it might be interesting to know why the Gothic style, so fashionable here, does not seem to be so much affected in America. Reasons may be assigned, not prejudicial to the style itself, but mainly referring to the peculiar circumstances of the inhabitants rather than to any peculiar preferences they have formed. One building, however, which Mr. Wheeler particularly referred to—the School of Art in New York—is of very good Gothic; and the decoration which he spoke of as formed upon natural and local bases is but the foliage of the carvings. Whether domestic architecture is at all likely to bring forth a new style of design in America, as Mr. Wheeler suggests, is a question which I think may be readily answered. I, for one, believe it is not likely to do so. I think if timber architecture—that is, the artistic use of timber in construction—were to become an American practice (which I do not suppose likely), then there might arise something like a national style of domestic architecture in America; otherwise I do not see any element in the ordinary construction of American houses which would lead American architects to deviate much from those models to which we in England are accustomed. They might not, perhaps, be expected to adopt our Elizabethan style,—to my mind the most charming of English modes,—but the various forms of our rural Italian might be suitable to all possible requirements. The state of criticism in America is one which affects the question of architectural style materially. Public criticism in England is bad enough; public criticism in America is worse. I have always had the idea, for example, that Parisians do not criticise their public works of art on the same vulgar principles that Londoners adopt. If our National Gallery were in Paris I think it might have been criticised severely enough, but more rationally and deliberately, and certainly in more artistic phraseology than our newspaper hacks have been in the habit of applying to it. But American criticism is even more vulgar and preposterous than ours. I remember the first Gothic spire which was finished in New York,—that of Grace Church, at the top of the then line of Broadway;—and I have never forgotten the opinion expressed about it by the 'New York Herald,' still one of the most influential, at all events amongst the journals in that city. The spire was *crocketted;* and the verdict passed upon it was, that it was "like an alligator standing on his head!" English architectural criticism has, perhaps, never attained this extremity of ignorant absurdity; but it always seems to me to be matter for grave regret when it runs, as it so often does, so decidedly in that direction.

Mr. J. W. PAPWORTH, Fellow, said as one important feature of American houses was the mode of warming them, he should be glad to hear a little more as to the mode in which it was done.

Mr. WHEELER replied there were many different systems, the most general being that of hot air from the furnace in the cellar, conducted by pipes through the whole house, and into every room. The pipes were generally tubes of tin varying from eight to fourteen inches diameter. It was a common arrangement in New York houses for the salons to be divided by scagliola columns, which were hollow, and carried the hot air to the rooms above as well as warming the apartment itself. The principal objection to this system was the very drying effects it had upon the whole material of the house, especially the woodwork, which rendered it very inflammable, and in case of fire the danger was much increased. The amount of heat was regulated by a valve in each room, which could be opened or closed at pleasure; and it was remarked that this system of warming formed also an excellent means of ventilation. Keeping the valves open introduced a delicious current of air into all the rooms in the summer time; and in the case of smoking parties, the room could be entirely cleared of smoke in a few minutes by these means. The supply of water in New York was abundant, and the service constant. He could not state the cost of the water to the householders, because the water and all other rates were paid by the landlord and included in the rent, the only thing paid for by the tenant being gas. In the country houses each resident provided his own water supply, and it was abundant everywhere.

In reply to inquiries by the Chairman, on the subject of sewage, cost of construction, the relative proportion of rent to cost, &c., Mr. WHEELER remarked that the theory of the sewage in New York was excellent, but the practice was abominable. They had one good arrangement which they did carry out—that was the way in which all the house refuse was removed Everything was taken away by the authorities before eight o'clock in the morning. Iron boxes were provided in each house, and carts went round to take away the contents every day. In the upper part of New York the sewage was carried by pipes into an enormous reservoir; a great portion of which was converted into manure at a place called Barren Island, a little distance from the city. The cesspits were emptied at night by atmospheric pressure, and the contents were carried to large iron tanks moored in the river on the east side of the city, whence it was conveyed to the place he had mentioned. With regard to cost of construction, he was unable to give any precise information owing to the very fluctuating value of land. The rise in value was often very sudden, and the cost of the site formed a large item in house-building in New York. As to structural cost, he thought it would be a tolerable safe estimate at 9d. to 10d. per cubic foot for an ordinary town house, and for a country house from 6d. to 8d. for an ordinary brick building. There was not in America any Building Act properly so called, but a system of inspection was established under what was termed the Fire Act, and conformity with that Act was enforced by the authorities of the city, inspectors being appointed for the several districts, who were required to inspect every new building, and to see that it conformed with the law. On the subject of the protection of the water-pipes in the houses from the frost, he said the best possible protection was afforded by the large amount of atmospheric heat which constantly pervaded the houses. It was a common practice to light the furnace at the commencement of winter, and to keep it in constant action till April or May. On the question as to the effects upon the health of living in an artificial heat at so high a temperature, Mr. Wheeler stated, as the result of inquiry into the state of health of the inmates of insane asylums in various countries, it was found that those of the Boston Asylum were in better health than those in any similar institution in any other part of the world. On the subject of dwellings for the working classes in America, there were, Mr. Wheeler said, no such dwellings. Some "model tenement houses" have, it is true, been put up in different cities, but unfortunately these have been in the hands of speculators, and with the recollection of the fearful tragedies therein from fire within the last few years, the less said about them the better. In New York and other cities the German and Irish portion of the population were the principal labouring classes, and they were allowed to squat in huts and shanties upon unoccupied land within a certain distance of any existing building; and there were thousands of them living in that condition in the outskirts. The distance limited would be perhaps a mile from the last house. It was a very shifting population. As building advanced, they had to shift further off, and he had not heard of any instance in which a freehold had been acquired by a twenty years' possession. With regard to fire-proof construction, some claims were laid to it, but looking to the numerous fires in New York, he thought the system adopted had not been very successful. Mr. Wheeler, in conclusion, regretted that time did not permit him to enter further into detail that evening, as some remarks had fallen from Professor Kerr and other gentlemen which he should otherwise have had much pleasure in answering. He trusted, however, that he might have an opportunity of doing so on some future occasion.

The CHAIRMAN having put the vote of thanks for Mr. Wheeler's paper, it was unanimously adopted, and the meeting adjourned.

June 6.

CRYSTAL PALACE, S.E.

Dear Sir

Your letter was delivered at my private house while I was absent and I received it too late to send your ticket today. You shall have it early in the week but I must confess admit surprise in your taking of a shareholder)

What shall you charge per 250 for the Inst. Arch. Paper without wrappers.

Yours
truly G Grove

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 17th February, 1868, D. Brandon, Vice-President, in the Chair, the following Paper was read :—

ON THE EXPLORATION OF JERUSALEM AND THE HOLY LAND.

By G. Grove, Esq., Hon. Sec. to the Palestine Exploration Fund.

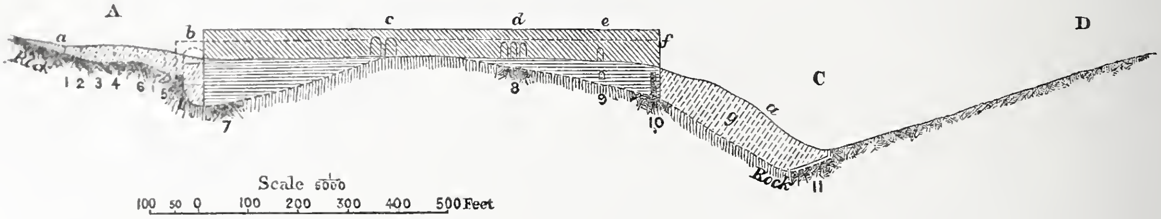
In bringing the subject of the Palestine Exploration Fund before the members of the Institute I shall be very brief in my remarks. It would ill become me to take up your time by the discussion of subjects not akin, or only remotely akin, to the objects of the Institute; especially when I believe that there is very much in the investigations of the Palestine Exploration Committee which is of the deepest interest to you, and may be encouraged and supported by you, with great benefit to the progress of architectural and archæological art and science. Still, before coming to this last, I shall in a few words put you into possession of the history and scope of the Association, and of its operations to the present time, because I think I have only to do so to shew you that the Society is formed on a really wide and enduring basis, and that part at least of its investigations are eminently worthy of your support and countenance.—The Palestine Exploration Fund was founded in 1865, with the object of exploring systematically and exhaustively all the various branches of enquiry connected with the Holy Land. It was known generally that the geology of Palestine was very remarkable, that its natural history and meteorology united the features of the tropic, temperate and arctic zones, and that its ethnology contained traces of a very large number of successive races. Then with regard to the connexion of the country with the Scriptures, before the correspondence between the land and the document could be really tested and brought out there were required accurate and detailed maps, with the vernacular names of places and spots very carefully ascertained. In the department of archæology and antiquities, it seemed most natural that a country so densely inhabited as Palestine was for many hundred years should abound in material traces of its inhabitants—of their modes of building, their domestic and their warlike arts. Now, with regard to every one of these branches of enquiry, nothing can really be said to have been known in an accurate and trustworthy manner till quite recently. True, the country has been travelled over by thousands of persons more or less eager and intelligent; but, with very rare exceptions, those travellers were not competent, or at any rate not prepared, for anything like scientific or systematic observation and record. They had not the time or the money to devote to the task. Of its geology and natural history only the general knowledge was possessed of which I spoke. Of its ethnology little or nothing was known. The maps, though fair to look upon, were neither detailed enough nor accurate enough for any purpose of elucidating the history; while with regard to archæology and architecture there may be said to be an absolute blank. Not only have we no knowledge of the styles or modes of building of the ancient Jews, but the absolute dearth of articles indicating evidence of human life is truly remarkable. A few coins of the probable date of the Maccabees are all the relics known of the nation. We know that they were very warlike; that they had pottery, jewellery, metal work, and other works of art; and yet, strange to say, not a fragment of any of these things exists—not a weapon, not a pot or vase, not a jewel, not a fragment of gold, silver, or bronze, is to be found in any museum of the western world of which it can be said, "This was the product of the nation of Israel during their prosperous period." The contrast between Palestine and Greece or Egypt, in this respect, is truly astonishing. This remarkable state of things may be due to two causes: (1). To the fact that the Israelites were not an artistic or constructive people; and (2). To the fact of the way in which the country was over-run and ravaged for hundreds of years, something like what Belgium has been in Europe—being the battle-ground or cock-pit in which the great powers around it—Egypt and Assyria, Rome and Persia, Turkey, France and England—have fought out their quarrels. Still, if not artistic or constructive themselves, the Israelites must have employed others to design and construct for them; for live, and fight, and worship, we know they did. And the mere mention of Belgium reminds one of the treasures of art and archæology which have survived all the conflicts of which it was the scene—and treasures there must be in Palestine to be found sooner or later, if they are but properly searched for.

We will therefore dismiss the subjects of natural science and even of topography, and consider what the Palestine Fund has done and hopes to do in exploring the architecture and archæology of the old inhabitants of the Holy Land. In the winter of 1865 Captain Wilson, of the Royal Engineers, who had in the preceding year distinguished himself by his survey of the city and environs of Jerusalem under the orders of the Director General of the Ordnance Survey, and at the cost of Miss Burdett Coutts, was dispatched to Beyrout in charge of the first expedition of the Palestine Exploration Fund. He took with him Lieut. Anderson, R.E.—a very able and practised surveyor—and a photographer. They landed at Beyrout in December, and remained in the Holy Land till May, during which time they worked gradually down the country to Jerusalem, fixing the latitude and longitude of the chief points and places, sketching —in the country, making more or less detailed explorations at the most promising spots, and ascertaining generally what might be advantageously attacked by future parties. The positive results of the expedition consist of materials for a map of the major portion of the country North of Jerusalem, which are now being reduced and engraved by Mr. Trelawny Saunders and Mr. Stanford under my own supervision; of 164 photographs—many of them of architectural subjects—and of plans and drawings of about 50 temples, synagogues, churches, tombs, &c., most of them never taken before. Among them are 7 ancient synagogues. These drawings and photographs are now on the table, and I trust that the members of the Institute may find them not unworthy of their attention. The second party went out in the beginning of '67, under the charge of Lieut. Warren, R.E., who is still in Jerusalem. Mr. Warren has done a great deal of surveying east and west of Jordan, and we may now say that we are in possession of materials for a really complete map of the Holy Land. But his chief results have been obtained in Jerusalem, and it is to them that I wish to draw the attention of the Institute.

Jerusalem stands on the end of a platform of table land, which on all sides except the north is surrounded by deep ravines. These ravines begin from the level of the table land, and grow steeper and steeper till at the S.W. corner they reach a depth of several hundred feet. At this point they unite and run off in one to the Dead Sea. The ravine on the east of the city was called the Kidron; that on the west, probably the ravine of Hinnom. There was formerly a third, which came down through the centre of the city. In Scripture it does not appear to be named, unless perhaps once in connexion with the Phœnicians; but Josephus seems to mention it as the *φάραγξ τυροποιων*—Tyropæon Valley—which may mean the "valley of the cheesemakers," or, not improbably, may be connected with the Tyrians—the merchants—who lived in this low spot, where the bazaars of the town were situated at the siege by Titus. There was also a fourth, which ran out of the Tyropæon eastward, somewhere north of the present "Dome of the Rock." Thus the place was cut up into three hills; one long hill on the west, and two shorter ones on the east. Now the outside ravines, though greatly filled up, are still deep and important. But the two inside are so choked and filled that one is quite undistinguishable, and the other nearly so. The portions of the city usually named in the Bible are the Temple-mount, and Mount Zion or the City of David. Josephus further names Akra, or the Citadel. Of these three, one alone is certain. The south-eastern hill was no doubt the site of the temple, and it is still the sacred place of the city. It is a tolerably level platform, 1530 feet from N. to S., and about 960 feet from E. to W. At its north end it is on the level of that portion of the town; but as it preserves its level towards the south, while the ground around it falls away, the walls which surround it became retaining walls, and at the south its surface is from 40 to 70 feet above the present level of the ground around. Its south-east corner is supported—within the retaining walls—by vaults, carried on piers and arches, and bounded on the west by a solid wall. From this wall to the south-west corner appears to be filled up solid, except where pierced by a passage which leads up to the upper level of the platform. This passage is outwardly a gateway ornamented with *appliqué* Roman work, and contains a large monolithic pier supporting groins. The solid rock of the platform is excavated into a large number of tanks, some of them of considerable dimensions, and there are passages and drains in every direction, portions of the ancient water and sewage service of the temple. Near the centre of the area, the rock emerges from the general level and stands up in a mass of some 60 feet by 40, and 10 feet high, containing a large cave. It is over this rock that the well known octagonal domed building is erected, which is called in Jerusalem *Kubbet es-Sakhra* (Dome of the rock), but by Englishmen, most unwarrantably, the Mosque of Omar. Concerning this rock, various opinions are entertained. Mr. Fergusson holds it to be the rock in which Constantine believed Our Lord to have been buried; others suppose it to have been the threshing floor of Arounah, and the site of the altar in the Temple. But whether the Temple occupied the whole or a portion of this area—whether the Holy Sepulchre was where the Dome of the Rock stands, or where the present church stands—is comparatively immaterial to my present object. *There* was the centre of the art and architecture of Jerusalem and of the Jewish nation, and it is there, if anywhere, that the remains of that art and architecture will be found. Mr. Warren fully appreciated this, and accordingly directed his attention to the southern wall of the Haram area immediately after his arrival. After a little opposition from the Turkish authorities, he began to sink a shaft on the face of the hill, 40 feet from the south-east corner, and here he immediately came on a wall, of the existence of which no one had any suspicion, running south and then bending south-west with a tower at the angle; descending to the foundations of this wall he made the discovery that this side of the hill is covered with 60 feet of made ground—so that the wall of the Haram is hidden for that depth. The wall, therefore, at the corner, if bared, would stand about 130 feet high. The masonry appears to be the same below as above ground. A shaft 40 feet east of the south-west angle revealed a still greater depth, namely, 87 feet from the surface to the rock, with a sharp fall westward, so that the depth at the corner must be 100 feet, and the whole height of the wall 160 or 170 feet. Mr. Warren has given a section of the lower courses—they are "bevilled" like those above; but the centre projection is much greater and more irregular. Mr. Warren's later letters describe the discovery of the western pier of Robinson's arch at a distance of 41 feet 6 inches from the wall, and at a depth of 30 feet below the surface. Two courses, and part of the third are standing; it is built with some attempt at economy, as the sketch will show you, with upright piers and long lintels. Between the pier and the wall is a flat pavement, probably resting on an inferior arch, and upon this pavement are still lying the voussoirs of the arch, apparently exactly as they fell when the arch was destroyed.

The structures which Mr. Warren has come upon in the six shafts which he has sunk across the valley in the line of Robinson's arch, can hardly have been portions of the ancient bridge or viaduct. They are neither massive enough nor in appropriate positions. These, therefore, are yet to seek. But 600 feet further north there is a similar arch, answering to Robinson's, and called after Captain Wilson, who has the credit of having first found it, or at any rate first made it public. Here also Mr. Warren is exploring, and here he has met with encouraging success. He has found two arches westward of and contiguous to Wilson's arch, each arch lower than that east of it, thus implying that they supported a sloping roadway. Underneath and connected with them is a system of tanks and aqueducts, which Mr. Warren is now examining, and of which I hope to have the details very shortly. Meanwhile, I may say that the arches are in two sets, parallel and adjoining each other; the northern set 13 to 13 feet in span, the southern 22 to 23 feet—as if the viaduct had been made narrow at first, and widened in a later age when arches could be built of a larger span. As to the intention of these remains it would be premature to speculate until more facts are known. All that I desire to impress on you is their abundance, and the comparatively good state of preservation in which they are.

SOUTH WALL OF HARAM AREA.



EXPLANATION.

Reference Numbers.	
1 to 6.	Shafts in line of Robinson's Arch. The Western Pier of the Arch discovered at No. 5.
7.	Shaft, 40 feet from South-west angle of Haram, 87½ feet deep to foundation of Haram wall on Rock.
8.	Rock surface at Triple Gate.
9.	Subterranean Passage under the Single Gate.
10.	Shaft exposing Rock surface and Wall abutting on South-east angle of Haram.
11.	Gallery in Kedron Valley.

a.	Present surface.	*d.*	Triple Gate.
A.	Tyropœan Valley.	D.	Mount of Olives.
b.	Robinson's Arch.	*e.*	Single Gate.
c.	Huldah Gate.	*f.*	Level of Interior.
C.	Kedron Valley.	*g.*	Broken stones.

Returning to the south wall of the Haram area, I would mention the significant fact that the floor of the vaults which occupy the south-east corner is many feet above the level of the rock outside,—at the single gate as much as 40 feet. It seems likely, therefore, that there may be a second set of vaults below those which are now accessible. Mr. Warren has, indeed, discovered below the single gateway a passage 12 feet high, running northwards for 60 feet at a depth of 20 feet below the floor of the present vaults. This passage appears to have had its entrance closed with a metal swing door, though what its use, or whither it leads, are not yet known. Mr. Warren is waiting for an opportunity to make further explorations in these vaults, which are very difficult of access.—The triple gateway is said by M. De Vogüé to be constructed in a similar manner to the double one: this must be verified. Then there is a mass of masonry at the south-east corner which MM. De Vogüé and De Saulcy assert to be a tower and to contain very ancient windows. These must be examined. Then the wall which I have mentioned as Mr. Warren's first find should be still further traced and examined, with the view to ascertain whether it was a wall of enclosure and fortification for houses on the face of the hill, or whether (as has sometimes occurred to me,) it was a retaining wall, in which case the level of the hill outside the Haram was originally and intentionally raised. The face of the hill itself must be searched for remains of houses.

Inside the Haram area we shall doubtless penetrate before long, and then we shall be able to complete the system of sewerage and water supply, and obtain an accurate section of the hill, and set at rest the long vexed question of the original intention of the mysterious rock over which the Kubbet es-Sakrah rears its lovely form.

The sepulchre or catacomb in which David and the Kings of Judah were buried is an object eminently worth searching for. We know that it was the only tomb allowed to be within the walls of the city. It must have been a very spacious tomb, since at least twenty persons were buried there from first to last. It is known to have existed down to the time of Herod; and there can be little doubt that it is still to be found somewhere under the rubbish of the modern city. Its discovery would show where the "City of David" was, and that fact alone would be of immense gain in the topography.

All these things, and many more, are crying out for investigation, and they cannot fail to yield, both in the search and in the actual discovery, results of much value to the architectural archæologist.

I repeat that I do not insist on the importance of the *topographical* questions involved in the exploration of Jerusalem, because I imagine that they will fall with greater force and fitness elsewhere. The course of the walls, the position of the gates of the ancient city, the identification of spots mentioned in the Scriptures and Josephus, the extent of the Temple, the site of the Holy Sepulchre,—these are all subjects which, though extremely important to individual members, hardly fall within the scope of the Institute. To the Institute, as a body, I suppose the most interesting question is the light which these investigations may throw on a period of architectural art which has been hitherto comparatively in the dark. Herod the Great was eminently a building prince, and Jerusalem was his chief feat. Did he employ Roman architects and builders on his works? and what influence did the climate, the materials, the circumstances or the traditions of the country, exercise upon them? These are questions which I take for granted are very interesting to you, and they cannot but receive much light from the investigation which I represent. Of earlier epochs than the Herodian I confess I dare not say anything. Herod probably demolished what remained of the earlier structures when he began his own work. There may be something still to find, but I cannot be sanguine about it.

The Committee of the Palestine Fund are about very shortly to consider the desirability of extending and hastening this branch of their operations by sending out more workmen, so that Mr. Warren may be able to attack more points at once; and I venture to suggest that it would be highly advantageous to the undertaking, and very gratifying to the Committee, and would help to give the investigation that national and dignified character to which it has aspired, if the Institute would afford the Committee that countenance to its operations, and I hope I may add that advice, which no other body is so able to give. Such a step would also have the effect (which I myself most heartily desire) of removing this most interesting spot,—*the City of Peace*, as its name implies,—from the confined arena and bitter conflict of theological debate, in which it has hitherto struggled, into the open air and the serener sky of artistic and archæological investigation.

The CHAIRMAN having invited observations upon the interesting subject which had been brought before the meeting,

Mr. JAMES FERGUSSON, Fellow, responding to the call of the Chairman, said, If I consulted my own feelings I would rather not have spoken upon this subject, because I cannot conceal from myself that I am considered to have partisan views upon it; but I have very great pleasure in proposing a vote of thanks to Mr. Grove, not only for his interesting and lucid treatment of the subject in the paper he has just read, but because he is truly the beginning and the end of the Palestine Exploration Fund. All the work has been done by him, and he deserves the greatest credit for the zeal and intelligence with which he has carried it out. The view he has put before us this evening is, I think, the right one. What we want now is a thorough investigation of the architecture as well as of the topography of this city. All that is upon the present surface of it is no doubt of the Herodian period. If we would discover what the old Jewish people were or did, it can only be done by digging through the surface, and there can be no doubt that Mr. Warren is going about the work in the right way. I do not, however, think it will be in the immediate vicinity of the Temple that the most important discoveries will be made, because that building has been destroyed over and over again, but when he gets to the city itself he will no doubt find something of the old Jewish period. Hitherto we have known nothing of ancient Jewish architecture, and neither Tyre nor Sidon, nor any other ancient city yet explored, has thrown any light upon the forms of Semetic architecture; but I hope in Jerusalem, when we get into the city, we shall find something of interest and value in this respect. I will not enter into the moot question of the topography of the city relative to which such diverse opinions are held. The most interesting discovery yet made is the wonderful development of the terraces of the Temple, 180 or 190 feet high. There are, I believe, no terrace walls of the kind in the world, and there are great hopes that we shall find some examples of the architecture, of which at present we know nothing. I hope this Institute will afford its aid and influence in forwarding this great work, which has been so well begun, and which I think is now in a fair way of being thoroughly carried out. I am happy to see the Rev. Mr. Smyth present, as I believe he has with him letters which he has received from his brother, who is now in Jerusalem, and has taken great personal interest in these explorations. I hope that gentleman will favour the meeting by reading some extracts from those letters.

The Rev. C. SMYTH (Visitor) then read the following extracts:—

"JERUSALEM, *January* 11*th*.

"Having presented our letter of introduction to Lieut. Warren, he kindly took us with him to explore all his shafts and mines. His discoveries are of a most interesting kind and very valuable, as likely to set at rest some long disputed questions relative to the position of the temple and its connection with the opposite height of Mount Zion.

"We first went to Wilson's Arch, the northernmost of the two arches over the Tyropœan Valley. We saw the whole arch lighted up with magnesian wire. The foundation of the Haram wall is at that point found to be 55 feet below the present surface of the ground, and a stream of water flows at that depth. At Robinson's arch he has sunk a shaft and found two or three tiers of the west pier, showing the span of it to have been nearly 42 feet; he has come across 16 or 17 of the old arch stones which had fallen in, and are now lying at a depth of 40 feet below the present surface. He has to break through or mine round these in his efforts to reach the foundations of the Haram wall. He is now working on a sort of pavement, and expects to find another arch below, as from the natural slope of the Tyropœan Valley the stream which passes under Wilson's arch must have found an outlet at a lower level than that at which he is at present working.

"Another important discovery has been made. An underground communication between the Pool of Siloam and the Virgin's fountain has long been known. But Warren has found another passage from the Virgin's fountain in the direction of the Haram. He has followed this up for about 250 yards to about 15 yards from the Haram wall, where he has sunk a shaft into it. We descended this shaft and went down the tunnel to within 50 feet of the Virgin's fountain and heard people talking. We did not go through, as there were 3 feet of water in the lower end of the tunnel. This passage may have been constructed in order to secure water in the time of siege. Another shaft has been sunk in the valley of Jehosophat, opposite the south-east corner of the area, and a mine carried along the surface of the natural rock. From this it appears that the old bed of the Kedron is about 40 feet below the present surface, and considerably nearer the city wall. The accumulation of *débris* here becomes very great as he works towards the city, and the mine became so hot that he was afraid he could not go on with it, when suddenly a few days ago, on breaking away through a large stone, a fresh cool current of air came into the mine, and he found an old wall of a house, probably at a distance of 100 feet from the Haram corner, and 150 feet below the present surface of the ground. He is following up the rock which here lies at an angle of about 30°, so he expects to find the foundations of the Haram wall about 90 feet below the present surface of the ground, which with the 70 feet of wall at present visible gives a total height of some 160 feet for the Temple enclosure—confirming Josephus's statement that its walls were so high as to make a man giddy in looking down from the top."

" *January* 21*st.*

" There is another work of Warren's a little below Job's fountain in the Valley of the Kedron. There is a place here where water often bubbles up from below. He therefore sunk a shaft, and struck into a vaulted passage, which so far as he has as yet explored (100 yards) goes straight down the valley, possibly the conduit referred to in 2 Chron. xxxiii. 3, 4, for carrying off the brook Kedron in order that Senacherib, on his coming to Jerusalem, might not be able to find water for his army. Since last I wrote, an important discovery has been made at Wilson's arch. A few days ago Lieut. Warren came upon a door or window bricked up. This he opened last Friday; and on the other side broke through an arch and let himself down some 10 feet on to the ground below, in the midst of a most complicated system of arches and arched passages. He then broke through the pavement and found exactly the same down below. I went through all these with him yesterday. In the lower story there are tanks and other water-works, which require further investigation to arrive at the purpose of their construction. All this new ground is to the west of Wilson's arch, but adjoining it and underneath a Turkish Judgement Hall and part of the Street of David leading to the Bab el Silsila (? Beautiful Gate of the Temple)."

Another letter has been received since the above, dated January 30th, and giving further particulars of the excavations at Wilson's and Robinson's arches. At the former, a room has been found with a central *Doric* column supporting two arches which had given way. No outlet had then been discovered; round the walls there were 16 or 18 ornamented pilasters.

At Robinson's arch on removing the pavement under the fallen stones a very carefully constructed tank was found within a few feet of the Haram wall, from this a water passage ran direct to the wall, where it divided into two branches going north and south immediately under and along the Haram wall. The north passage has not been followed; but the south has been traced to within a few yards of the south-west corner of the Haram area. Whether it will be found here to turn under the wall and so into the area, or to join the passage leading down to the Virgin's fountain, or to follow a more direct course to Siloam, will probably be known in the course of a few days.

Mr. **Charles Barry**, Vice-President, said: Mr. Groves has interested us very much by the details of these explorations which he has brought before us, and I have no doubt the effect of his paper will be to add to the number of subscribers among the members of this Institute, as well as to the interest which he seeks to excite in these proceedings. But in order that it may be done intelligently, I think it would be very desirable that he should give us some of that practical information which we want in dealing with money. He has given us a description of what has been already done, and he has told us the amount of funds he has in hand; he has also intimated that in the course of ten or twelve months that fund will be exhausted; but he has not told us how much the expenditure has been in making the series of discoveries which have been described, nor has he given us any idea of his own and Mr. Warren's anticipations to what extent the present funds will carry them, assuming they go on as satisfactorily as they have begun. It would be interesting to know whether they can form any idea of the amount that may be required, and the time over which the explorations may last if they are carried to a sufficient extent for the perfect elucidation of the temple area. I think some definite information with regard to the amount which has been spent upon the work, as far as it has yet been carried out, will give some encouragement to the subscriptions, which I hope will receive some additions from the large meeting which we have this evening.

Mr. GROVE.—I am much obliged to Mr. Barry for putting this question. The cost of the explorations which I have mentioned to-night, up to this time, has been about £1,700, including the expenses of sending Lieut. Warren and two assistants to Palestine, and their pay. What further expense may be incurred is a question of how much is to be done. The present expenditure is about £200, but we might advance from that to £500. per month with great profit and advantage. What I should like to do with regard to this Fund would be to rescue it from its present temporary and spasmodic condition, and put it on the footing of regular yearly subscriptions. I am about to propose to the Committee of the Fund a plan, by means of which we may obtain a regular yearly income with which to go on exploring not only Jerusalem but other parts of the country also. I do not wish to leave out of sight that there are other departments to be explored besides the architecture and topography of Jerusalem. The geology and natural history are but very imperfectly known, and they are highly interesting and important. The geology is not only very remarkable in itself, but it contains the key to the geological problems of the Red Sea and the formations of North-Eastern Africa and North-Western Asia. The natural history unites and concentrates in itself many remarkable features of the tropical, temperate, and arctic zones. The geography and topography have much still to yield where every square mile of ground has been the scene of some interesting or important event, recorded by chroniclers who knew the spots intimately. The ethnology is a field which I believe to be extremely rich, and hitherto quite unworked. There is a great number of persons who will give their £20. or £50. towards this Fund, as our necessities arise, but I should prefer to see it placed on the more permanent footing of annual subscriptions. As to the period, however, over which those subscriptions should extend, I cannot at present give you any idea, because I may hear by the next mail of some discovery leading to results hitherto quite unexpected. All I can say regarding that department which affects the Institute is, that the old city appears to be lying there beneath the modern nearly intact,—only waiting for the removal of the *débris* which presses it down.

Mr. JOHN P. SEDDON, Hon. Sec.—I have great pleasure in seconding the vote of thanks to Mr. Grove for the most interesting paper he has given us. Personally it has afforded myself the greatest possible interest, and I may, perhaps, be allowed to refer to the picture which was painted by my late brother, Thomas Seddon, which was purchased for the nation, and is now exhibited at South Kensington, as it happens to represent the very locality which has been mainly referred to in the lecture, and to give its present aspect of the valley with the utmost accuracy. The character and colouring of the vast accumulation of *débris* which overlie the apparently original slope of the precipice is therein shown, as having exactly the aspect of the tips from mines and quarries with which we are familiar in this country. Nevertheless, the depth of the ravine and the steepness of its banks are sufficiently striking, and from it may be gained some idea of the stupendous grandeur which must have characterized the effect, if the Temple walls were ever visible to the full extent of the amazing height which has been described, and the depth of the valley was as great as the section exhibited by Mr. Grove would appear to prove it once to have been.

Mr. M. DIGBY WYATT, Fellow.—Mr. Grove's passing reference to the fact that the illustration of the ethnology of the country is one amongst the contemplated objects of the Society, opens out interesting prospects of what it may be enabled to effect in the future. The most casual observers of museums, and the most superficial students in archæology, cannot fail to be struck in contrasting the yield of the Holy Land in remains of antiquity with those art-treasures of all kinds which have teemed upon the soil of Egypt, Greece, Nineveh, Rome, and other places. On those historic sites illustrations of the mode of life,—of the manners and customs,—and of the peculiarities of successive dominant races seem to turn up with every square yard of virgin soil in which excavations are made; while, on the contrary in the Holy Land, no indication whatever appears to have been as yet discovered in a tangible shape of the nature of the technical arts of the country. Hitherto no success has, it is believed, rewarded research by former explorers in this particular; and I should therefore be glad to hear in detail,—firstly, whether in the investigation of tombs, or in any of their excavations, any fragments illustrating the technical arts of the country have been discovered by the Palestine Exploration Society—and secondly, whether those who practically conduct the work have the intention to extend their examinations over a considerable area. In going to such a great depth as that in which, judging by the diagrams, the main shafts have as yet been sunk, the sewers, the old water channels, and probably certain subterranean passages connected with the ancient defences of the city may be perfectly well investigated; but it is scarcely to be anticipated that many relics will be discovered which will throw light upon the arts and habits of the people. It seems to me that it is by carrying the excavations over a large area, and to a moderate depth only below the surface, that any results of that kind are likely to be arrived at. At present nothing of the sort seems to have been discovered, and I hope Mr. Grove may be able to assure us that this branch of the contemplated investigations may be looked upon by the Society as one of no secondary importance.

Mr. GROVE.—Mr. Digby Wyatt is quite right in his remarks. Not a single weapon, not a coin, not a piece of metal-work of any kind has been discovered. It is almost as if no people of any race or kind had existed in the country. Going down to the great depth which this shaft of 87 feet indicates, it is natural to expect that at the foot of a wall, which must have been tenanted by soldiers and others for many years, some coins or other articles would have been dropped. The only things Mr. Warren has found are some small pottery vessels and two little glass bottles, and those were found, not at the foot of the wall, but in the subterranean passage from the Virgin's Fount, and they have been pronounced by competent judges to be of a date not later than the fifteenth century. I desire here to take the opportunity of enforcing what I said in the concluding remarks of my paper, when I referred to the single-handed efforts of the Committee of this Fund. Neither I nor Captain Warren pretend to any special knowledge on the subject, and therefore what I most earnestly covet is, that an intelligent and learned body like this Institute should say: "We should like such and such things done; such and such kind of research made." If you would favour us with some notion of that kind it would strengthen our hands very much, and not only give us the dignity and position I spoke of, but would increase the benefits likely to result from these investigations, because instead of groping in the dark we should be working towards objects with which you are conversant and familiar, and the special significance of which is familiar to you.

The Rev. Mr. SMYTH inquired whether the filling up of the Kedron Valley was from *débris* of rock or from natural soil.

Mr. GROVE replied, that Mr. Warren reported it was all composed of stone chippings. It might be either the fragments from the dressing of the stones of the wall, or the *débris* which had been tipped over during the many successive demolitions of the place. Looking from the Mount of Olives, the whole of the side of the valley next to and below the wall appeared like one enormous "tip." It had exactly that form, and also was of a grey *limy* colour, like destroyed masonry.

Professor ANSTED, Hon. Member, said, I should be glad to add to the stock of information on this subject more directly than I am able to do, and there are many points of geology which might have been enlarged upon, but this would not be a fit place to introduce them; but with regard to the extraordinary appearance of the chipping of stone alluded to, from what I have seen in that part of the world—though I have never been at Jerusalem—I can perhaps explain them. Those who have visited Greece, and countries where the rock is chiefly brittle lime stone, readily acted upon by the weather, and have noticed the result of time on walls or buildings, will be prepared to recognise a similar result on naked rock. In many places where scarcely any buildings remain, and where there is no evidence of former civilization, one sees heaped together a vast amount of angular stones. The traveller fancies he sees the ruins of an ancient city, which must have existed for centuries; but when he looks with a geological eye, with a view to make out how the result has really been produced, it is clear that all these fragments of rock are nothing but the result of the action of the weather on the great mass of the limestone itself exposed at the surface. A large portion of the buildings of Greece have been built originally of rock brought from no great distance; the old walls and buildings have served afterwards as quarries, and the result is a vast confused heap, partly derived from old buildings and partly from sub-ærial denudation. In the valley near Jerusalem there may have been fragments thrown down, and an enormous extent of artificial as well as natural destruction of this kind; but in the instance before us I think a large proportion of the filling-up of the valley is in all probability the result of sub-ærial denudation.

Mr. GROVE.—It has been broken up and carried. All the way down the side of the hill is formed of fragments of rock scarcely moved from the place. They have been split up and left alone. I will read you Mr. Warren's account of this:—

"The shingle is composed of stone chippings without a particle of earth, and in character almost fluid."

Professor ANSTED.—That corresponds with what I have seen at Cephalonia. There there is a large quantity of material heaped by the side of the mountain, and where the angle is steep I found the mass to consist of loose shingle corresponding with the rock above, and innumerable broken fragments of limestone. All this is the result of denudation. It depends upon the angle of the slope whether the stone broken away by weathering is rolled down or left *in situ*.

Mr. R. BELL, Fellow.—The brown tint on the drawing shows a large mass, and from the inclination, it must have formed somewhere about the summit of the walls of Jerusalem itself. In some of the Rhine valleys you see large masses of *débris* fallen from the rocks, but it is difficult to understand how such a mass as is shown by the brown tint could have been on the summit of that rock at the time these walls were built, or for a long time before. From the inclination, it must have fallen that way, and not from any mountains that surrounded it.

Professor ANSTED.—It is work constantly going on. To the observer unaccustomed to geological investigation it may seem to have commenced only lately—since, for example, the walls of the city were constructed, but in fact it commenced when first the rock was exposed bare to the action of the weather, and from that time there has been no cessation. The actual and relative elevation above the sea may have varied by elevation or subsidence, and may have been different when this work commenced; but since then there has been a constant destruction of the rock—a moving down where there was a slope, and where there was no slope to allow the fragments to be removed, the result was a constant breaking-up of the surface to a depth continually increasing. In the case of the Greek Islands, these things are seen on a large scale, and are clear and unquestionable, and there I speak of my own knowledge, but it is difficult to explain a matter of this kind merely from a drawing or section, and when one has only heard for the first time a description of it.

Mr. CHARLES BARRY.—Does Professor Ansted wish us to understand this geological phenomenon can go on *ad infinitum*—that the surface of such rock can go on disintegrating ifself, and that below an already disintegrated surface for 20, 30 and even 90 feet in depth? which is here the depth of the *débris*.

Because, if so, that will occasion serious anxiety to architects for the foundations of buildings which are built upon rock with perfect confidence, and without any idea that it is going to misbehave itself in this extraordinary way. I understand from Mr. Grove that the surface of the masonry at the depth down to nearly the surface of what is supposed to be the original rock was dressed in a coarser style than that above the present surface. Surely this is not consistent with the theory either of disintegration, or with that of the walls being intentionally carried down through such a stratum of *débris*. Another question suggests itself, from Mr. Grove's description, which increases the wonder we should feel at the constructors of these enormous walls under the theory which Professor Ansted has advanced. Mr. Grove states that Mr. Warren, in driving his exploring shafts through the *débris*, has met with great difficulty in getting through, and his frames have been crushed at even a moderate depth; and when we hear that the walls are supposed to have been carried down through 70 feet depth of this *débris*, what astonishment we must feel of that process of construction being carried out under such difficulties.

Professor ANSTED.—I do not want to keep up the discussion of a question purely geological, and although some things that I have said may appear theoretical, they really have a practical bearing. I wish to point out that in limestone districts, where the stone is exposed to the action of the weather, and where it is not sheltered by buildings or cultivation, the destruction of the rock at the surface is commenced by weathering and destroying the surface, but soon penetrates the *débris* and reaches down to a very great distance indeed. I may point out generally there are good proofs of similar action in other hard rock (not limestone) in the Channel Islands of Alderney, Guernsey, and Jersey. I have recorded in the work,—a copy of which I have had the honour to lay on your table this evening,—a section made for road purposes in one of these islands through granite rock, in which it was found that the solid granite had been decomposed and converted into a mixed mass of gravel and large round boulders. These boulders of granite are produced by the weathering or partial decomposition of the rock to a depth of about 70 feet. In limestone there are no such striking examples in the South of England; it is chiefly in the southern and eastern shores of the Mediterranean where the limestone is hard and brittle, and crowded with minute fissures, into which the rain and vegetation make their way, that the great results are produced. I remember instances in which an olive tree has burst asunder blocks of stone of large dimensions, lifting them completely out of their place; and I have seen a stone weighing not less than 15 or 16 tons thus moved by the roots. It is an undoubted fact that even in the case of perfectly dry angular gravel, without a particle of soil, vegetation can exist, and vines thrive and do well. With regard to the dressing or facing of the stones now buried in this mass of shingle, not having been on the spot I cannot speak with certainty. I can only suggest that the walls were probably constructed throughout in a manner not unusual in that part of the world. All the stones are fairly dressed, and are squared so accurately as to leave no crevices either above or below, or at the sides. Partly from habit, and partly from a sense of security, the walls, even where not seen, may have been thus constructed. This style of building was common in the east, where Cyclopean walls were as common as in Greece and Italy. Some parts of the walls are buried, but they are all probably constructed in the same way,—carefully squared, the outer surfaces roughly dressed, and all the stones fitted very closely indeed. I imagine this must have been the style of wall built in this part of Jerusalem.

Mr. WALTER MORRISON, M.P., Visitor.—May I, though not a member, say a few words on this subject? I have had the good fortune to have been at Jerusalem, and to have lived for years in that district of our own country which is perhaps most like Judea in outward appearance, viz., the mountain limestone district of the West Riding. There we are familiar with these slopes of *débris*, locally called "screes," broken off by the action of frost, &c., wherever the limestone is exposed. And so at Jerusalem, as all who have been there will recollect, on the western slope of the Mount of Olives the limestone crops out in terraces like steps, and yet neither on that nor the similar eastern slope of the mountain do you find anything like the same accumulation of *débris* as on the slope from the Haram to the Kedron. Again, the soil on the Mount of Olives is of a red colour, that on the Haram slope among this shingle of a grey, limey, appearance. I am myself inclined to think that the largest part of this *débris* consists of the ruins of Herod's Temple itself, as thrown down first by Titus, and afterwards by Hadrian. We must recollect that the buildings must have stood some 100 feet higher than the present level of the Haram, and we know the columns alone were 60 feet in height. I may mention that I came here to-night chiefly to see Mr. Grove on business connected with this fund, of which I am one of the treasurers, and as such I cannot but express my gratification at the interest which has been shown in our work to-night. But I would point out this; where you have to explore beneath masses of *débris*, it may be, 90 feet thick, it is most necessary that we in England should work with our brains, as well as our workmen in Jerusalem with their hands. When we open a shaft we must exhaust all possible knowledge out of it, and then fill it up at once again, lest some true believer should tumble in by chance, which would be the end of all exploring at Jerusalem for a long time to come. And so also before we drive a shaft at all, we should collect and collate the opinions of all who can advise us; and there is nobody better fitted to assist us in this respect, and to advise us as to the quickest and most economical mode of carrying out our present investigations, than the body which I have the honour to address to-night.

The CHAIRMAN.—It is now my pleasing duty to submit to the meeting the proposition which has been made of a vote of thanks to Mr. Grove for his paper. I hope the introduction of this subject before us will be the means of assisting the subscriptions to this Fund, and that many names will be added to it this evening. I may, in the name of the Institute, say that we shall be most glad to give every assistance which lies in our power, either as a body, individually, or through the Council. There is a Committee of the Council for the "Conservation of Ancient Monuments," to whom this subject may be very properly referred; and if Mr. Grove will put himself in communication with the Council I am sure the matter will receive their anxious consideration.

The vote of thanks having been unanimously passed,

Mr. GROVE, in responding to the compliment, said, I can only express how indebted I am for the opportunity which has been afforded me of bringing this subject before the notice of the Institute, and how encouraged I am by the kind manner in which the Chairman has met the suggestions I threw out, and I shall not fail to take advantage of, by that encouragement, communicating with the Council at the earliest opportunity.

The meeting then adjourned.

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 16th March, 1868, CHARLES BARRY, Vice-President, in the Chair, the following Papers were read:—

SOME ACCOUNT OF THE ANTIQUITIES AT FREJUS, ON THE SOUTH-EAST COAST OF FRANCE, FROM INFORMATION FURNISHED BY THE PRESIDENT, W. TITE, ESQ., M.P.

By Professor DONALDSON, Hon. Sec. For. Corr.

MOST of our Fellows must be acquainted by books, and many of our Members must be familiar by personal inspection, with the ancient Roman towns distributed throughout the south of France; and the stupendous ruins, of which at Vienne, Orange, Nismes, and Arles reflect the monumental magnificence of the Romans, equalling almost in point of size, nobility of character and grandeur of execution the sumptuous monuments of the Eternal City. Following the line of the Via Aureliana, along the south-east coast from Teulon to Nice, the traveller meets with frequent recurrences of the giant footprints of the ancient conquerors and civilizers of Gaul: and the recent visit of our President, Mr. Tite, afforded him the opportunity of visiting some curious remains in that part, and of writing me some particulars, which I shall embody in the following short description, together with information to be derived from a pamphlet which he sent to the Institute, describing the antiquities of Frejus, the ancient Forum Julii. I will make a passing allusion to such local guides as these by our neighbours, in regard to the manner in which they are got up. They are generally carefully compiled from existing authorities, completed by exact information of the present state of the objects described, and frequently accompanied by ably executed woodcuts, a class of illustration which they have borrowed from us, and which M. de Caumont, our Honorary and Corresponding Member of Caen, was among the first to adopt, thirty years ago, and profusely to introduce in his Archæological Itineraries.

CITY GATES.

The general plan of the town represents all the principal objects of antiquity. There remained traces of four city gates, called locally the Gate of the Gauls, the Gate of Rome, the Golden Gate, and the Porte Paticière, the last of which is now destroyed. The first of these is the Gate of the Gauls, the plan of the forecourt of which is semi-circular, 183 feet in diameter. The two towers at the angles were about 30 feet in diameter. The thickness of the city wall is 8 feet 8 inches, the height 30 feet, having on the top a footway and a parapet 2 feet 3 inches high and 2 feet thick. The gateway itself, which has two openings into the city, is 72 feet wide. The great trunk road of Aurelius from Rome to Arles passed through Frejus by this gateway, which stands now in the Garden of the Pères Cordelliers.

PORTA ROMANA.

Immediately opposite to the Gate of the Gauls, on the other side of the Old City, is a mass of masonry forming all that remains of the Porta Romana. A restored elevation of one of the openings is on the sheet before you; for, like the Gate of the Gauls, it had two openings, the one for those entering the city, the other for those leaving it, and thus avoiding the confusion of two streams of passengers and cars passing in opposite directions. The face is of wrought masonry, the heights of the courses about 2 feet, a little more or less, as they varied somewhat. The thickness of the walling was 10 feet.

Only a part of one side of one of the gateways remains, some 16 or 17 feet high. The restoration is from the description of the Abbé Girardin, an archæologist, who published his history of the town and Church of Frejus in 1729, at a time when much remained that is now destroyed, and which he appears to have recorded with exemplary exactitude and fidelity.

I am strongly of opinion that a wide leading street passed through the town straight from the Porta Romana to the Gate of the Gauls, as was the practice with the ancients, flanked on each side by public buildings, and often having on either hand continuous colonnades of the Corinthian order, as was the case at Palmyra and many cities at Asia Minor, built at the time of the Antonines.

Golden Gate.

This is a fine mass of construction, still existing. The view represents the south face. It is situate about a hundred paces outside the town, in a garden belonging to the Convent of the Filles de S. Dominique, and led to the ancient port, now some miles distant from the sea, which has receded. There were originally three openings, two of which are destroyed, this alone remaining, with traces of the intervening piers. Its construction consists of rough rubble work for the centre of the wall, bonded by occasional tiers of bricks in courses, and faced with wrought stonework. All around this gateway are vast masses of construction, piers and walls, some of them a yard or two above ground, but the purposes of which have not hitherto been ascertained. The whole are of most massive materials, firmly held together by the mortar, which is of excellent quality, and firmly uniting piers, terraces and abutment walls of great height, which but for the cementitious quality of the mortar would inevitably tumble down. In the circuit of the walls there are several towers, of a segmental form or plan, still remaining in ruin: in the lower story are square-headed apertures for windows, but the upper range are circular-headed. The mass of the construction is of rough work, with courses of bond and faced with small wrought stones.

Circus.

We next come to the site of the Circus to the west, outside the town near the walls, oval on plan and more than 150 paces long. Some of the walls, arches, and concrete vaultings still remain round the whole circuit; and it seems that the Circus was partly sunk in the rock on which it was built, and was constructed with rough masonry in the body of the walls, faced with wrought stonework: and terra cotta occasionally was used. The whole of the ancient buildings of the Forum Julii were apparently built at the same period, and generally of a rough cast of construction; but the stones do not seem usually to be of large dimensions, on account of the hardness of the material, it being a kind of porphyry, and the quarries of which are at S. Raphael, a small village near. There are, however, beds of stone affording larger blocks for steps, seats, and such features. The greater axis of the arena is 209 feet long by 130 feet for the less axis. The external dimensions are 373 feet by 270 feet; and it was capable of containing about 9000 spectators, or about one-fourth of the supposed population of the ancient town, now reduced to 3000 souls.

Theatre.

On the slope of a hill facing the south-east, the Theatre was placed, the plan of which is plainly indicated, as much of the construction still remains. The largest dimension of the base was about 236 feet, its depth about 100 feet, the width of the stage some 26 feet.

Aqueduct.

The Romans are for nothing more remarkable than the mode in which they provided their towns with ample supplies of fresh water. Rome was fed by twenty streams, brought into the city by fourteen aqueducts, some of them from sources tens of miles up in the Appenines. Springs were sought in the remotest wilds, and channels were formed at one time on the level of the surface, occasionally carried underground, and at other times traversing valleys by arches, and spanning across the Campagna for many miles on lofty aqueducts. We need not be surprised that the conquerors of the world should carry the impressions produced by such stupendous work into their distant provinces. Considerations of necessity, health and comfort set at naught all calculations of cost, and they endowed the towns they founded or conquered with the like noble works. Fréjus is an example of this prudent, wise policy, and we find the remains of an aqueduct, now no longer in use, which, running up the valley of the Reyran, brought down the water from the source of the river Siagne, many leagues distant, into the town itself. For a small provincial place, this was a grand undertaking, it being frequently intercepted in its course by many valleys and irregularities of the surface of the ground, and carried upon arches more or less in number and varying in height. The construction resembles that of the city gates, the Circus, and the monuments of the city already alluded to. Close to Fréjus there is a series of piers for a length of 2335 feet, and 39 feet high. The arcades have an opening varying from 14 to 20 feet, and the piers are about 5 feet wide to 7 feet 6 inches. The more lofty aqueducts have buttresses projecting at the foot of the piers about 10 feet, diminishing and sloping rapidly up to the top of the stones forming the arch. The channel for the water course has a semi-circular top and flat bottom. The sides are sloping, so that the opening is 2 feet 6 inches at the springing of the arch and 1 foot 8 inches below, and 3 feet 9 inches high. The whole surface is rendered with a coating of fine hard cement, the main construction being formed of a concrete mass of broken tiles, bricks, gravel, sand and lime, producing so compact and homogeneous a mass, harder than stone itself, that at the arches of the Grisolles the channel still exists in its length, although only here and there resting on the solid construction, and at the end looking like a vast beam 30 feet or more long, with a wide gap beneath.

I shall not further detain you by describing the remains of the Basilica, the Temple, the Mausoleum, the Thermæ, and other antiquities, of which there still exist, *in situ*, more or less extensive fragments. They all bear the impress of largeness of treatment and varied construction according to the destination of the erection. Portions of statues have occasionally been found, as also altars, and inscriptions relating to the legions stationed there. I must not omit to mention that our Honorary and Corresponding Member, M. Texier, has studied and illustrated these antiquities with his usual care and intelligence, and thus contributed to a more accurate appreciation of them, whether historically or structurally considered.

ON THE MEDIÆVAL ARCHITECTURE OF CENTRAL AND SOUTHERN GERMANY.

By H. W. Brewer, Esq.

Mr. Seddon, in a paper which he recently read before the members of this Society, called your attention to the many beautiful examples of Gothic architecture in the Rhine country, and I am sure that those who have heard or read his paper must be grateful to him for the masterly way in which he has treated the subject. It is with the hope of inducing him, or some other member of the Institute, to continue the subject by investigating the ancient towns and churches in central and southern Germany, that I have accepted the very flattering invitation to read a paper before you to-night. I feel myself thoroughly unworthy of such a distinction. I must beg that you will pardon any errors or mistakes which I may be led into by my want of knowledge or experience. I must also ask you not to be too critical over the sketches, some of which were made several years ago. I have exhibited them, because a sketch, however rough, often gives a better idea of a building that the most lengthy description.

Leaving the Rhine at Mayence, and proceeding in an easterly direction, one passes through a very unpicturesque country. The first place of any importance is Darmstadt, which will not long detain the antiquarian or architect; and, in fact, no place of any interest is to be seen until the spires of Aschaffenburg come in sight. Here is a fine large church with a nave and western transepts of very early Romanesque work, said to have been erected in 974. The west end of the church and the transepts are surrounded by a kind of open cloister, and there is also a large cloister surrounding a court on the north side; they are both transitional in character, and consist of narrow semi-circular arches supported upon coupled shafts. The interior of the nave is remarkably plain. The choir, which is very short and square-ended, is good First Pointed work, remarkably French in appearance. The church contains two fine bronze monuments by Peter Vischer, and a curious kind of " Baldacchino " supporting a shrine, also of bronze, and probably a work of the earlier part of the sixteenth century. There is a large and rather noble looking palace with five lofty towers, built in a style strongly resembling our Jacobean, and two or three not uninteresting churches, one of which has a very pretty " first pointed" spire of stone.

Leaving Aschaffenburg, the traveller passes through the beautiful forest of the Spessart, and following the river Maine, we come first to Gemünden, which is conspicuous on account of the four lofty towers crowned with extinguisher roofs at the angles of the ancient walls which still surround this little town, and the pretty slate spire of the church. The next place worthy of notice is Karlstadt, a most picturesque little town, with walls, lofty towers, and a fine Romanesque church. A few miles further on are the two desecrated abbeys of " Ober" and " Unter" Zell, the one converted into a farmhouse and the other into a printing office; neither are very interesting buildings, though one of them possesses a good late Romanesque gateway. Proceeding along the river for about a mile, we pass the charmingly situated and pretty little Carmalite convent of " Himmelspforte " or " The Gate of Heaven." The present building dates from the year 1497; portions of the church are earlier. It is an interesting specimen of a small religious house of that period, and has fortunately escaped modernization The whole is in a very good condition, and still inhabited by a small community of nuns. Immediately upon passing the " Himmelspforte," Wurzburg comes in sight. I know of no town in Germany, except Prague, which presents such a charming appearance from a distance as Würzburg. Situated upon both sides of the Maine, which is here pretty broad, on the left bank no less than twenty towers and spires, nine of which seem to be close together in the centre, are seen in a group. On the right bank of the river, upon an escarped rock, rises the castle, a large quadrangular building, with square towers at each corner, and a lofty circular one in the centre. At the foot of the rock are a number of gabled houses, with three or four churches, and a picturesque fourteenth-century bridge connecting this portion of the town with that on the opposite side of the river. The whole forms such a picture of Mediævalism, that it is difficult at first to realize the fact that one is not looking at the back-ground of one of Albrecht Durer's pictures, instead of a busy town in the nineteenth century. Upon entering the town and more narrowly inspecting it, one is disappointed. Whitewash and Munich architects have done much to destroy this picturesque city. The buildings erected in what is called "the Munich style," are simply detestable. In addition to this, most of the churches have suffered terribly from seventeenth and eighteenth-century modernizations. The cathedral has been a fine Romanesque church of grand dimensions, nearly 400 feet long, with deep transepts, and four spires, two at the west end, and two at the angles of the choir and transepts. The last-named towers or spires are very remarkable, as they are the loftiest Romanesque towers in Germany. They rise square from the ground to the height of the transept walls, and are then "broached" into an octagon. Square pierced buttresses are carried up two stories higher, and then there are two more stories simply octagon. These terminate with gables to each of the eight sides, and a short slate spire. The sides of the octagonal portions of the towers are pierced with numerous windows. The whole is built in alternate courses of red and white stone, a mode of construction very uncommon in Germany. Internally this great church has been so modernized as to retain scarcely a single feature of its original architecture; it contains, however, a fine series of monuments of the ancient Prince Bishops who ruled Würzburg for 800 years and more. These monuments are placed in upright positions against the piers of the nave. They consist of boldly carved effigies standing under canopies; each effigy represents a bishop holding a crosier in his left hand and a sword in his right;—the earliest dates from the eleventh century. Those of Bishops Scherenberg and Von Bibra are the work of Tilman Riemenschneider, a native of Würzburg; the date of the former is 1495, of the latter 1512; both are of red marble, and are amongst the finest works of the period in Germany. There is a remarkable bronze font, bearing the date 1275, and curious cloisters with windows filled with clumsy perpendicular tracery. Close to the cathedral stands the Church of St. Killian, or the "Neu Münster," celebrated as the burial-place of Walther von Vögelweide, and the scene of Longfellow's poem 'Minniesänger.' It is a very late Romanesque building, terribly modernized, but still retaining a very pretty octagonal tower, like those of the cathedral, built in alternate courses of red and white stone, and an apse with some remarkably classical-looking detail; the probable date of this portion of the church is not earlier than 1230 or 1240. The church contains two fine pictures by Lucas Cranach, some very early stall-work, probably coeval with the building, and a pair of noble elevation candlesticks, bearing the date 1540.

The "Marien Kapelle," in the Market-place, is a good example of German Second Pointed work, very rich and rather graceful. On one of the buttresses is an inscription recording the commencement of the building of the church in the year 1377. This church is exceedingly rich in sculpture; the three doorways, the buttresses, and internally the columns are filled and surrounded with fine statues of saints; they are all the work of Tilman Riemenschneider, and are far less mannered than most German sculpture of the period. On the opposite side of the river is the Church of St. Burkard, with its nave erected between 1033 and 1042, of most singular Romanesque work; the columns have a decided "entasis," and very classical-looking bases. The two late Romanesque stone spires of this church are very remarkable, and show a singular and very early use of the crochet. There are some fine stalls, and an old fifteenth-century altar with a large triptych reredos. The "Deutsch Haus" Church is a charming specimen of fourteenth-century work, with a very beautiful doorway. In the Castle is a circular church, which is probably a work of the tenth or eleventh century; the floor is entirely covered with effigies of bishops and priests; they are all of a late date, and not particularly interesting. In the sacristy is a fifteenth-century reliquary of fine workmanship.

The neighbourhood of Würzburg abounds in interesting little towns. Ascending the Maine from Würzburg for about two miles we come to Heidingsfeldt, which possesses a large church, consisting of an Early Romanesque nave and tower, and Third Pointed transepts and choir; it contains a fine tabernacle of stone, a very elaborate fifteenth century stone pulpit, and a life-size representation of the "Agony in the Garden." In the churchyard is a stone cemetery lantern on a column, and a curious charnel-house. The town is curious, and possesses its ancient walls and gates. Eblestadt, Randesachre, and Gossmansdorf are passed in the next three miles; all are interesting little places. Ochsenfurth, which is a mile and a half from the last-named place, is a most charming little mediæval town, with its old walls, towers, and gates quite perfect. It contains a fine church, chiefly fourteenth-century work, but with an earlier tower. There is a superb tabernacle, most elaborately carved in stone, above 40 feet high; a bronze font, the work of Peter Vischer, and some very fine "cinque cento" chandeliers; against the columns are several statues by Tilman Riemenschneider. In the churchyard is a beautiful little chapel, about 50 feet by 20, with an apse and a crypt under it; the doorway has a "Last Judgment" in the tympanum by Tilman Riemenschneider. The Rathhaus bears the date 1499 in a carved panel of the front; it is an exceedingly interesting little building, with a picturesque clock, turret, and external staircase; it retains much of its ancient furniture. There is also an old hospital, with the chapel over the porch containing its original altar "in situ," and many interesting specimens of domestic architecture. The next eight or ten miles of the course of the Maine abound with places of interest. The time will not allow of my giving any distinct account of them, but I cannot proceed without mentioning Sulzfeldt, a most perfect mediæval village, hardly at all altered from what it was in the sixteenth century; Dettlebach, with its picturesque Rathhaus, built over a stream; Volkach, with its pilgrimage church and stations, very similar in design to those at Nuremberg, and sixteenth-century Rathhaus; and Hassfurth with its two fine churches.

Another most interesting series of towns within a short distance of Würzburg are situated upon a small river called the Tauber, a tributary of the Maine. At the junction of the two rivers is Wertheim, with a large castle in ruins, and in scale and pictorial beauty second only to Heidelberg; a fine church, containing a stone rood screen and a very beautiful fifteenth-century monument. A few miles further up the river is Bishofsheim, which also possesses an old castle, and a church with two stone tabernacles and an ancient high altar; and further on still is Rothenburg, perhaps the most perfect mediæval town of its size in Germany. It possesses eight most interesting churches; the principal one, that of St. James, is a noble specimen of Second Pointed work; it is about 300 feet long, without transepts, in the place of which are two square towers crowned with open-work stone spires of unequal height; internally there are three superb triptych altars—the high altar adorned with pictures by Lucas Cranach, and the other two with wood carvings by Tilman Riemenschneider; very extensive choir stalls, and most glorious stained glass. The churches of St. Sebastian and St. Wolfgang also retain their ancient altars. There is a magnificent Town-hall, partly Third Pointed and partly Rennaissance, with a curious bell-tower; all the gates are quite perfect, and and there is a complete system of mediæval fortifications as perfect as it was when first carried out in the sixteenth century. The houses in the town are most valuable and perfect specimens of fifteenth and sixteenth-century domestic work, most of them unmodernized. In fact, I know of no place which carries one more thoroughly back to the Middle Ages than this charming little town.

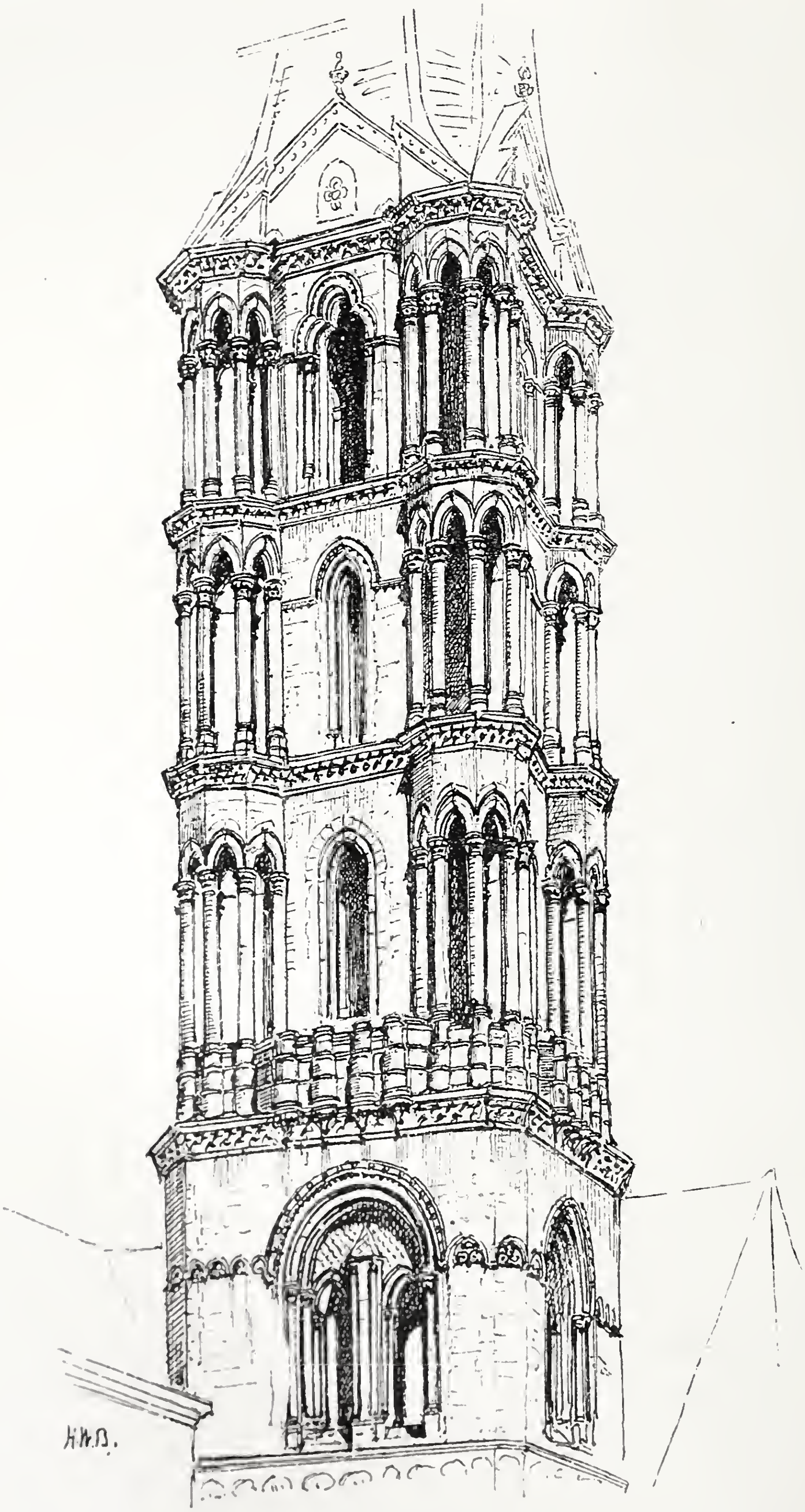


Fig. 1.

I must now leave this most interesting district which surrounds Würzburg, but I cannot do so without expressing an opinion that in no other part of Europe can so much that is thoroughly mediæval be seen within so small a compass.

About fifty miles from Würzburg is another ancient ecclesiastical "Free City"—that of Bamberg. Bamberg from a distance presents a grand appearance, though less striking than Würzburg. The city is built upon seven hills, each of which is crowned by a large church; the most remarkable of which is the cathedral. This noble church consists of a nave and aisles, with a choir and polygonal apse flanked by tall square towers, surmounted by octagon lanterns and spires at the east end, and transepts, apsidal choir, and two lofty spires at the west end. Each choir has a large crypt under it, and is raised ten or twelve feet above the level of the nave. They are approached from the nave by double flights of steps, between each of which is an altar on a level with the nave floor; these altars are isolated from the wall in such a way as to leave a space at the back, from which there is a large opening looking down into the crypts; a large chapel with aisles forms a kind of continuation to the south transept. The church was originally founded by St. Henry in the year 1004, and was consecrated in 1012. This building was entirely destroyed by fire in the twelfth century. Of the present church the earliest portions are the eastern choir, lower portions of the two eastern towers, and the three first bays of the nave; these were not completed until 1237. The great eastern apse—the earliest portion of the existing church—is a remarkably fine Romanesque work; it is covered with zig-zags and all kinds of ornament. The nave of the cathedral originally had a flat timber roof, and the present quadripartite vaulting has caused the blocking up of the alternate clerestory windows. This portion of the church is transitional in character, but the pointed arch is only very sparingly used, showing how very far Germany was behind France and England in adopting Pointed architecture. Nor is this a solitary example,—for the church of Kloster-Ebrach, near Bamberg, which is quite Romanesque in character and exhibits scarcely any use of the Pointed arch, was completed as late as the year 1285. It is a singular fact that the further east one goes in Germany the longer the Romanesque style seems to have been retained. In the south-east of Austria and Hungary there are several Romanesque churches built after the year 1300; for instance, that of Sœchisher Reen on the borders of Hungary; on the doorway of which is an inscription recording its foundation in the year 1330. In the east of Hungary and parts of Servia the Romanesque style existed even to a later date, and the churches of Mannasia and Ipek were both erected after the year 1400, and neither of them possess any Pointed arches. This would seem to argue strongly against Gothic architecture having been introduced from the east.

The next portions of Bamberg Cathedral in point of date are the transepts and western choir, which were completed in 1274; they are very fine Early First Pointed, but with the round arch still used though sparingly. The two western towers, which are the most beautiful portions of the church, were erected after 1274. [*See* fig. 1.] These exquisite towers bear such a resemblance to those of Laon in France that one is almost led to believe they were copied from the French church. Here we have anothe proof that the Germans were far behind the French, for the towers of Laon were built between the years 1225 and 1235, whereas those of Bamberg, which appear even earlier in character, were not commenced until after 1274. These towers are square to the level of the choir walls, and are then carried up octagonally with octagonal buttresses consisting of beautiful open arcades supported upon slender columns; the towers themselves are also pierced in all their stories: these stories are marked by bold projecting cornices. The pediments and spires which crown and disfigure these noble towers are either modern or have been altered during the seventeeth century. The interior of this cathedral is very striking and solemn, though plain and severe; the beautiful warm colour of the stone adds greatly to the effect, and the grand quadripartite vaulting of the nave and the eastern choir directly attract admiration. The eastern apse is vaulted with a semi-dome, and the arcade running round the lowest portion is very singular. The arches are supported upon intertwined columns, some of which are tied together with great knots in the centre. In front of this apse stands a modern high altar of very unobjectionable design, surmounted by a large bronze crucifix by Thorwaldsen; the stalls are fourteenth-century work. Against the south wall is a bronze effigy to Bishop Ebenett, by Peter Vischer. In the centre of the choir are two other monuments, both thirteenth century work. As before mentioned, this choir is raised about twelve feet above the level of the nave, and at the back of the stalls are solid stone walls separating it from the aisles; towards the aisles these walls are divided into two stories by beautifully carved cornices; the lower story is occupied by an arcade of pointed arches supported upon detached shafts, with richly carved capitals quite French in character. The upper story consists of an arcade of trefoil-headed arches, filled with remarkably fine statues, representing the Twelve Apostles and the Twelve Prophets, the Annunciation, and St. Michael and the Devil; the heads are most noble, and the whole sculpture reminds one of the western doorway of Amiens; the spandrils are filled with most charming conventional foliage; these screens are probably of the same date as the western towers.

The two doorways in the eastern towers have very fine statues inserted, of a later date than the doorways themselves; the canopies over them are good specimens of the conventional representations of the Heavenly Jerusalem so common in France and Italy during the twelfth and thirteenth centuries. The great north doorway contains figures of the Prophets supporting the Evangelists upon their shoulders. Under the eastern choir is a large crypt, the vaulting of which is supported upon two rows of cylindrical columns; it contains a holy well. The nave is very simple internally, and possesses no triforium; the western choir is more rich, and the vaulting ribs are ornamented with small "zig-zags." The western apse is singularly beautiful; it is pierced by two tiers of lancet windows, with groups of shafts in the jambs and rich mouldings. The western choir crosses the transepts, and is separated from them by solid stone screens similar to those of the eastern choir, except that they are decorated with thirteenth-century frescoes instead of statues; these frescoes are very much faded, but still are very interesting. The western choir contains a modern high altar, and a fine set of fourteenth century stalls with canopies over them. In the centre of this choir is a most singular monument, consisting of a classical sarcophagus of white marble, standing upon a thirteenth-century base, and with a twelfth or early thirteenth-century effigy lying upon it. This remarkable monument covers the remains of Pope Clement II, who died in the year 1047. He was formerly Archbishop of Bamberg, and is one of the very few popes who lies buried on this side of the Alps. Nothing whatever is known about the history of this most singular monument; the sarcophagus, which is ornamented with centaurs and other mythological figures, cannot well be later than the third or fourth century, and may be very much earlier.

In the western choir are two other remarkable monuments; they are large bronze effigies placed in an upright position against the walls; they are in very low relief, but perfect marvels of workmanship; they are works of Peter Vischer, and represent Archbishops Gross von Trochau and Truchses von Pommerfelden. The transepts are similar in architecture to the western choir. The north transept has a fine rose-window of plate tracery; the walls are arcaded within. In the south transept over an altar is an ivory crucifix, given to the church by the Emperor St. Henry II., and consequently dates as far back as the eleventh century. Attached to the piers of the nave are several remarkable bas-relief monuments of archbishops, two of them are as early as the twelfth century; there are also several frescoes in similar positions, which probably served as monuments. In the centre of the nave stands the magnificent altar tomb of St. Henry II. and St. Cunigunda; it is entirely of white marble; the sides are ornamented with panels containing representations of various events in the lives of the two saints, and their effigies lie upon the slab of the monument; the workmanship of the whole is very delicate and refined. It is in a a most wonderful state of preservation, was executed between the years 1499 and 1505, and is the masterpiece of Tilman Riemenschneider.

As this is the last time I shall have to mention the name of this great master, I cannot help expressing a regret that we know so little of his works in this country. To my mind he was one of the greatest sculptors Germany ever produced; his works are far more severe and simple in spirit than those of Adam Krafft or Peter Vischer, and indicate a great deal of that quiet religious feeling which is so noticeable in works of the thirteenth century.

Attached to one of the great piers of the chancel arch of the eastern choir is a most remarkable work of the thirteenth century. It is simply a life-sized equestrian statue of St. Stephen, King of Hungary; the horse has a wonderfully classical look about it, and might almost have walked out of the "Elgin marbles." The rider is very inferior as a work of art to the horse; he is represented as clothed in chain mail, and is rather stiff and cramped.

In a very small chapel leading out of the south aisle of the nave is an altar with a carved wooden reredos of the fifteenth century; it is the work of Michael Wohlgemuth, and represents the separation of the Apostles; it is richly decorated with gilding and colour. Leading out of the south transept is a large chapel, dedicated to St. Andrew. This chapel is divided into a nave and aisles of equal width and height by two rows of columns; the northern portion is superb First Pointed work, thoroughly French in character, and the southern late Second Pointed, rather plain. There are three altars, two of which are ancient; the reredos of one of them is a large triptych enclosing a picture by Lucas Cranach, containing more than three hundred heads. The walls of this chapel are entirely covered with bronze monuments, representing archbishops, bishops, and priests; they are in low relief, and consist of life-sized effigies standing under canopies. The earlier ones date from the end of the fifteenth century, and the latest the commencement of the sixteenth. The earlier ones are very spirited and fine, the late ones are poor and flat. In this chapel and other parts of the cathedral there are more than one hundred and thirty of these monuments. The sacristy, which is very interesting, is entered from the chapel; it contains a superb pascal candlestick of silver, about 5 feet high, bearing the date of 1216; is covered with foliage, birds, beasts, and all kind of ornament, and bears a strong resemblance to the "Gloucester candlestick," exhibited at the Loan Collection, except that in the Bamberg candlestick the work is more delicate and refined. There is a large reliquary of silver and crystal, about 8 feet high, enclosing a smaller one presented to the church by St. Henry in the year 1004; this contains a third reliquary, of probably a still earlier date, entirely of cut crystal, within which is the largest relic of the true cross known to exist; the relic itself is in the shape of a cross about 9 inches long and 4 across the arms. Whatever opinions may be entertained respecting relics—whether we believe that this piece of wood is a portion of the true cross or not, few can look without interest upon an object which caused the foundation of one of the grandest churches of Germany, of an imperial city, and one of the most ancient Prince Archbishoprics in Southern Germany. It was to enshrine this relic that St. Henry erected the first cathedral on this spot. Subsequently he gave the town to the Archbishop and his successors, and the town of Bamberg owed its importance to the pilgrims of all nations, many of them kings and princes, who came to visit this relic. In so great reverence was it held that the town, although at one time containing nearly 40,000 inhabitants, was never fortified, and it is probably the largest ancient town in Europe which has never had any means of defence. The sacristy also contains a remarkably fine remonstrance of the fifteenth century, two reliquaries of the same date, and a vestment of the fourteenth or fifteenth century.

Bamberg Cathedral, as before stated, stands upon the top of a hill, and round the church is a terrace with a curious fifteenth-century work parapet, and a kind of stone reading desk at the east end. The view from this terrace is charming, and is closed by the finely formed mountains of Franconian Switzerland. Close to the cathedral are the remains of the ancient bishops' palace: the gateway is curious cinque cento work erected in 1540; the rest of the building is a good example of a half-timbered erection of the fifteenth century, with external galleries supported upon bold corbels. There is a large seventeenth century palace adjoining; it is a fine building, entirely of stone, and is enriched with a gallery of pictures.

Bamberg contains twelve other churches besides the cathedral, of which the most interesting are the Benedictine Abbey Church of St. Michael, a large Romanesque building with two Third Pointed spires and a late apse. The church contains several fine monuments, the most interesting of which is the tomb of St. Otto, which is in a singular crypt under the crossing of the nave and transepts; the crypt is entered from the nave by a large archway, in front of which is the altar for the parish; and the "Obere Pfarr" Church, which has a noble apse with flying buttresses and surrounding chapels of fine Second Pointed work. The interior of this church has been modernized, but it still contains a very large triptich of carved wood-work, which originally formed the reredos to the high altar, but is now under the organ loft, and a very rich stone tabernacle. Several of the other churches are interesting, but the time will not allow me to describe them.

I shall not attempt to give any description of Nuremberg. That magnificent old town has been so thoroughly well described by Mr. Charles Eastlake in a paper read before the Architectural Association, that I think it is quite unnecessary for me to say anything more about it, so I shall pass on to Ratisbon.

The Cathedral of Ratisbon is one of the most noble churches in Germany, and also one of the largest. Perhaps no church of its size in Europe is so remarkably simple in plan and arrangement; it consists of a short nave and aisles, with five bays only; the western bay is flanked by two square towers. The transepts do not project beyond the walls of the aisles; the choir consists of three bays, and a three-sided apse. The aisles of the choir are terminated with three-sided apses, and to the east of them are sacristies. Some idea may be formed of the large scale of the building from the fact that the bays of the nave and choir are 30 feet from centre to centre. The nave is more than 40 feet in the clear and 120 feet high; the aisles are nearly 30 feet wide, and 65 feet high; each of the western towers are 42 feet square—so that the aisles are as large as the nave of many of our English cathedrals. The building, however, is short for such gigantic proportions in other respects. The west front is very imposing, and reminds one of the façades of the French cathedrals. It is of various dates; the south tower was begun in 1404, but is in the style of a century earlier; the north tower, which is the same in general arrangement, but totally different in detail, was completed to the height of the nave roof in 1482. The gable of the nave bears the date 1486. The beautiful and highly original triangular porch, which forms so striking a feature of this front, is a work of the earlier period of the fifteenth century. The sculpture with which it is adorned is uncommonly fine. This front remained unfinished for nearly 400 years, but is now being completed by the carrying up of the spires; they will reach the height of 400 feet when finished. The effect upon entering the church is strikingly magnificent; the great height and width, the beautiful proportions, the general harmony of design throughout the whole building, the magnificent old stained glass with which nearly all the windows are filled, and the rich orange colour of the stone form a combination to be met with in no other German church; to add to this, all the fittings are ancient, except the high altar, which is a work of the seventeenth century, very inoffensive in design, and entirely of silver, partly gilt. It is difficult to conceive the value of this most costly article of church furniture; but when I state that the altar is more than 20 feet long, is

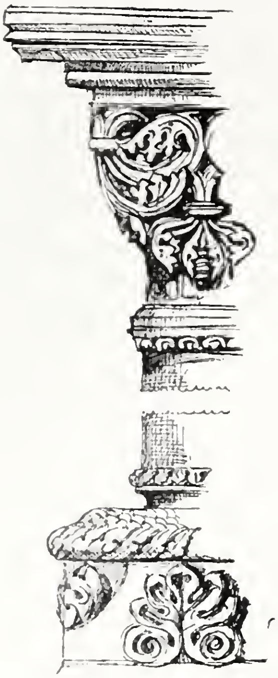


Fig. 2.

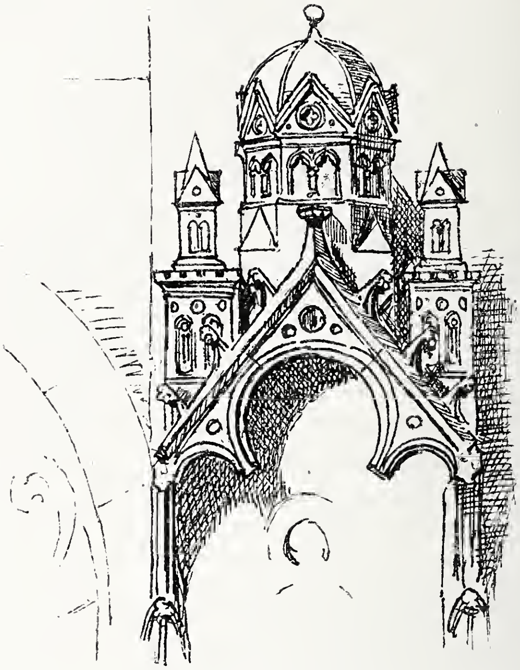


Fig. 5.

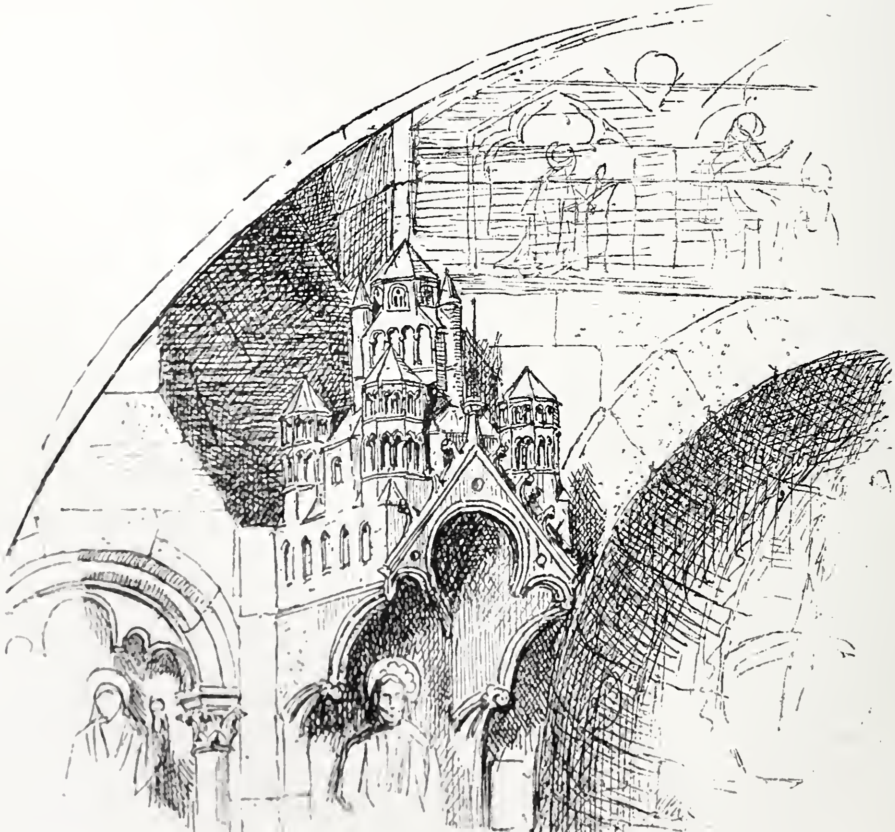


Fig. 6.

the same in height to the top of the canopy over the throne, and that the silver is nearly a quarter of an inch thick, some notion may be formed of its value.

The earliest portions of the Cathedral are the lower parts of the three eastern apses; they are thirteenth-century work, and were commenced in the year 1275; the detail is very interesting and beautiful; the capitals of the arcade round the apse of the southern aisle is very original in design, and nearly Romanesque in character. [*See* fig. 2.] The upper portions of these apses are rather later, but very pure and good. The great eastern apse is beautifully designed; it has two tiers of four-light windows, with an open triforium between them, the tracery of which is double. All these windows are filled with early stained glass of the most brilliant and magnificent description. I have certainly never seen any glass so rich in colour. The nave and transepts are rather later than the choir, very simple and dignified. The vaulting is good, and early in arrangement, although not constructed until the close of the fourteenth century. The triforium is not pierced over the nave and transepts, but forms a simple passage with an arcade in front of it, as in our English cathedrals. There is a passage through the walls in front of the aisle windows, below which is a very bold arcade of trefoil arches, supported upon finely carved corbels. There is an ancient draw well, with a stone canopy over it, in the south transept; and five of the altars have lofty stone ciboria over them. These ciboria are ornamented with statues under canopies, and are supported upon pillars; they retain their ancient coloured decorations. There is also a stone pulpit and a tabernacle of the fifteenth century. The church is not rich in monuments; the most remarkable is a small bronze tablet, by P. Vischer, and the large "cinque-cento" monument of Cardinal von Wittelsbach, which stands in the centre of the nave, upon an altar tomb of red marble. The Cardinal is represented kneeling before a crucifix, larger than life, and executed in gilt bronze. The cloisters of this Cathedral, which are very extensive, are not entered from the church, but are quite isolated in the north-east of the church. They surround an oblong space, and are bisected by a large hall which is vaulted, and entirely covered with ancient monuments of every description. It is difficult to walk over the floor, as every stone is deeply carved with the effigy of a priest or bishop. Some of these carved slabs have been let into the walls in an oblique direction, and others stand upright against the walls. The windows of this singular hall are curious specimens of late Third Pointed work, with a strange mixture of Italian detail. A small doorway on the east side leads into a singular Romanesque chapel, dedicated to All Saints; it is square at the base, but becomes octagonal above; internally it is quite devoid of detail, but has been entirely covered with fresco; it has small apses to the north, south and east. In the last stands the original altar. It consists of a slab of green marble six inches thick, four feet wide, and four feet long, supported upon a square pilaster in the centre and four small columns with cushion caps at the angles. Externally this chapel is roofed with a short stone conical spire. A Romanesque doorway at the north end of this hall gives access to another chapel of still earlier date. It consists of a nave about 50 feet by 25; the vaulting is quadripartite without ribs; on each side are four small semi-circular apses, and there is one of larger dimensions at the east end which contains the original altar, the lower portion of which is perforated with circular openings. The chapel is dedicated to St. Stephen, and is said to have been the original cathedral; it is evidently very early, and may date from the end of the tenth century.* The walls are covered with plaster both within and without. The sacristy of the Cathedral is well worth seeing, and is full of fine works of Mediæval art. The following are some of the most interesting :—

One processional cross of bronze with figure, of the twelfth century.

One processional cross of silver-gilt, set with real stones, of the fifteenth century.

One processional cross, copper-gilt, with imitation stones (no figure), of the fifteenth century.

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* In Germany, during the middle ages, rubble work was always covered with plaster, and in many instances brickwork also.

One large altar cross of solid gold, the front adorned with fillagree work and large bosses, figure solid gold, back ornamented with the evangelic symbols in enamel, and the front set with uncut rubies. This is also of the thirteenth century.

One altar cross of silver, with figure in "*maiello*," of the fifteenth century.

Two small shrines in Limoges work, of the thirteenth century.

Three chalices, of the fourteenth and fifteenth centuries.

One crosier, of the fourteenth century.

Six large silver altar candlesticks, late in the sixteenth century.

Six large silver altar candlesticks, of bad design, of the eighteenth century.

Nearly touching the Cathedral to the south-east is a very beautiful and interesting little First-Pointed church. This remarkable building is called the "Alte Pfarr," or St. Ulrich's Church. It is nearly square in plan, about 70 feet by 55 feet. It consists of a nave of six bays, with a deep vaulted gallery projecting over the two first; there are also galleries over the aisles and covering the whole of the eastern bay, except a small square space over the altar; so that above two-thirds of the entire area of the church is covered with galleries. These galleries are supported upon very solid octagon columns, with finely carved caps; they are vaulted both above and below. The arrangement of the western gallery is strikingly picturesque. [*See* fig. 3.] There is a fine double west doorway, with a rose window over it. At the east end of the south aisle is a large and very solid Romanesque tower. The architecture of this church is so French in appearance, that one would be led to believe that it was the work of some French architect, were it not that there is so much architecture of a very similar character in Ratisbon. Close to this church are two large and much modernized Romanesque churches—the Neider Münster and St. Mary's Chapel. The Neider Münster contains three old altars under ciboria, very similar to those in the Cathedral. The frontals of the altar are pierced with tracery, and show recumbent figures under the altar slabs; it is probable, therefore, that they served the purposes of monuments as well as of altars. There are many other interesting churches in Ratisbon, but time will only allow of my mentioning three. The first is the Scotch Benedictine Abbey Church of St. James, which is one of the most perfect Romanesque churches in South Germany; it consists of a nave and aisles, with an eastern chancel and apse flanked by square towers and western transepts. Internally, the old flat boarded roof remains. There is a fine late Romanesque doorway on the north side, and remains of a cloister on the south. The Dominican church is very long and lofty; it is a good specimen of early Second Pointed work, and was commenced in 1278. It contains a good set of stalls and several fine monuments. The chapter house and cloisters remain in their original condition, and are interesting. The Abbey church of St. Emmeran is a large much modernized Romanesque building, full of ancient monuments, and contains a very interesting porch or narthex, a fore court with a curious First-Pointed gateway, and a beautiful Romanesque crypt under the western choir. There is a superb silver shrine containing the body of St. Emmeran; it is a work of the fourteenth century; and in the sacristy are preserved some very early vestments and crosiers of the abbots, who were also princes of the empire. On the south side is a very fine cloister, part of which is most beautiful First-Pointed work; most of the windows have been replaced in the fourteenth century; those which remain consist of an open arcade of four arches supported upon coupled columns surmounted by a small well window.

The domestic architecture of Ratisbon is certainly the most ancient of any town in Germany. The "Goliaths-haus" is a perfect specimen of a thirteenth-century town dwelling house, which has suffered scarcely any alterations. The windows consist of open arcades, supported upon detached shafts with the casements placed behind them, so that the woodwork of the windows is quite independent of the architectural members. This form of window is very common in Ratisbon, and above a hundred

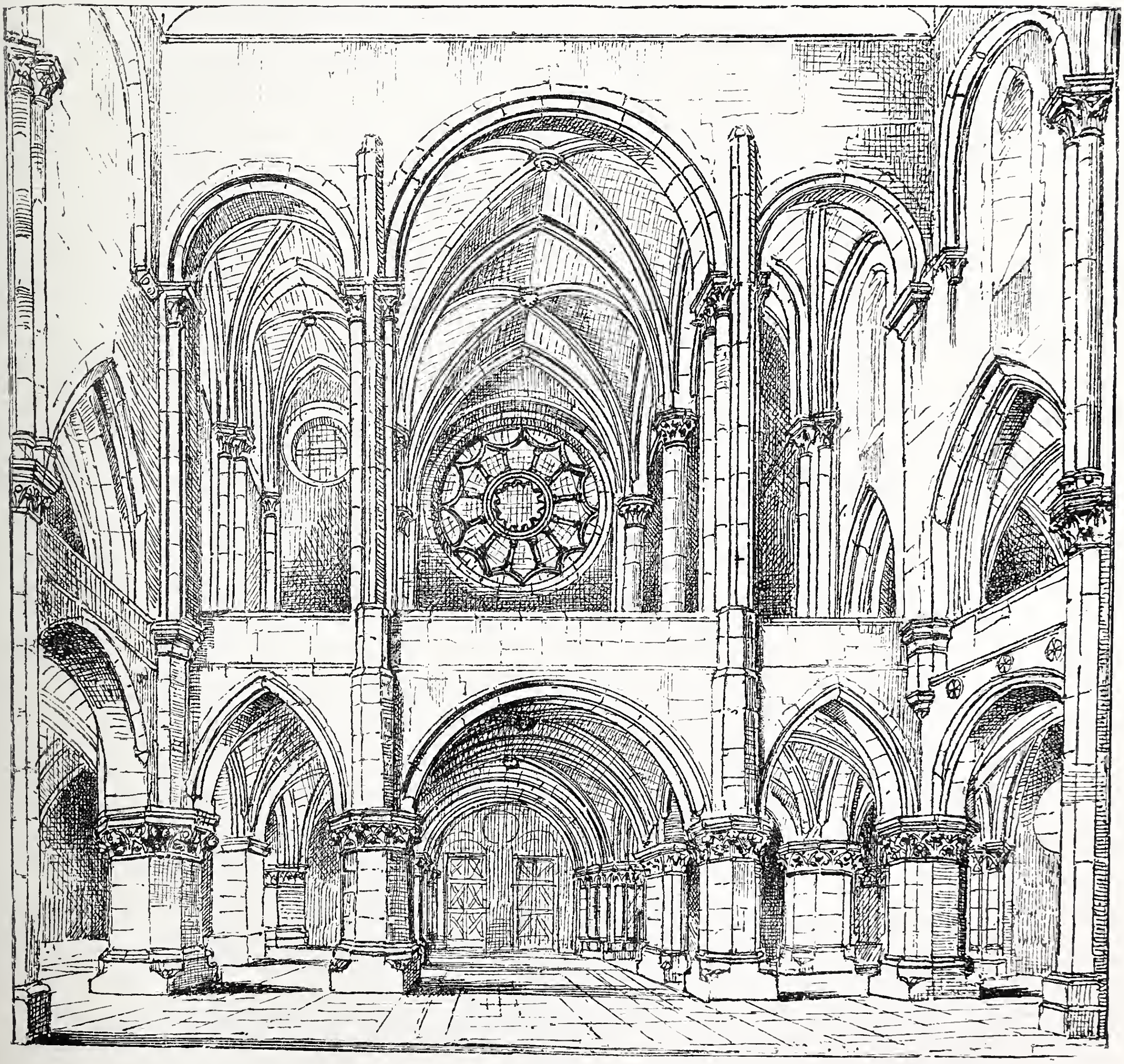


Fig. 3

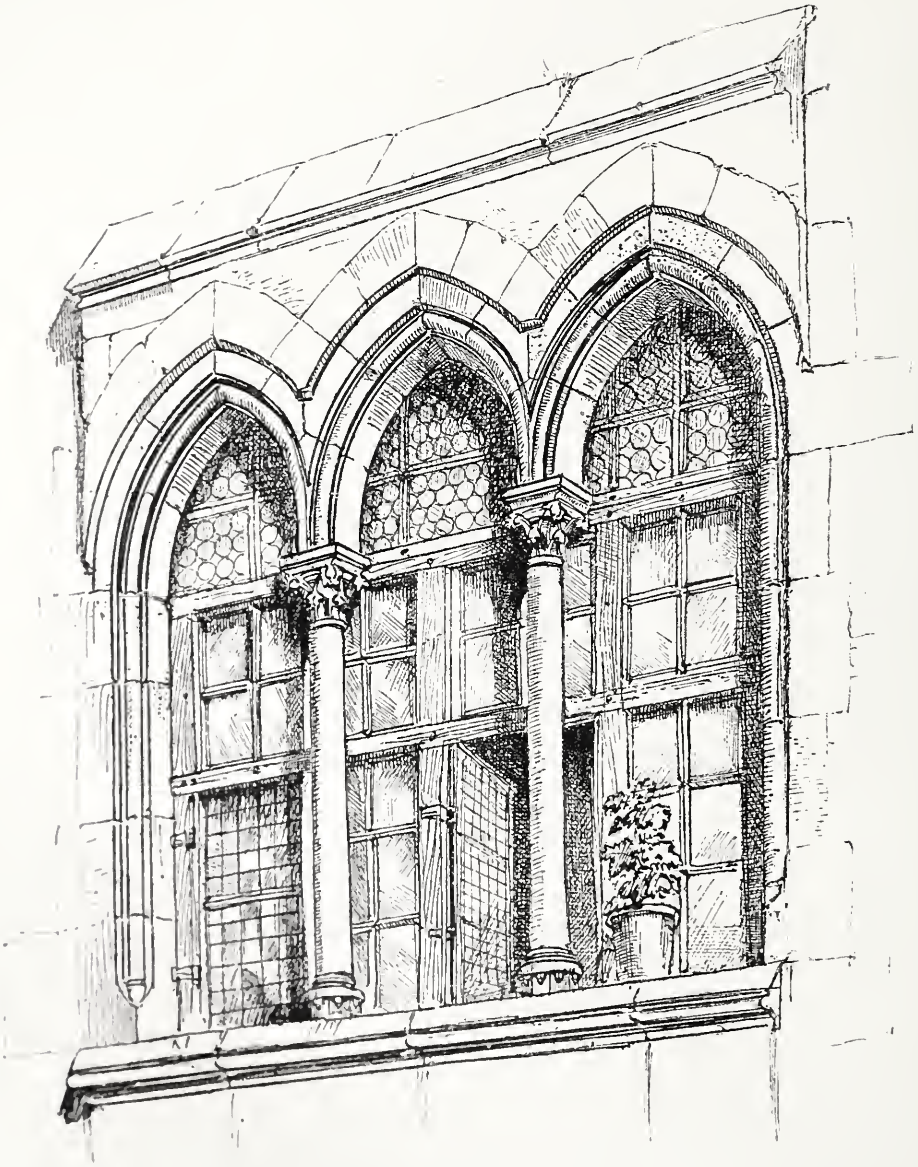


Fig. 4.

examples of it may be found in various parts of the town. [*See* fig. 4.] The lofty square towers which are to be met with in nearly every street of the town are also remarkable features. They were evidently used as dwelling houses, as they are all furnished with large windows of the kind already described. The Rathhaus, which was completed in the year 1400, is a most interesting building; it has a remarkably rich doorway, and a very prettily designed bay window. The interior contains some old furniture and tapestry. The old bridge over the Daube, with its gateway tower, is also worthy of notice.

On the road from Ratisbon to Munich is Landshut, a most interesting and beautiful old town, with one of the finest streets in Germany, and a church with a tower 420 feet high, entirely constructed of brick. This church contains a splendid old stone high altar and pulpit, and is of noble dimensions. There is also a castle containing a very curious First-Pointed chapel, with a gallery all round; four altars, one of which is in the gallery, and stands under a First-Pointed ciborium, ornamented by two very singular niches. [*See* figs. 5 & 6.] The whole is a remarkable specimen of First-Pointed work. The Church of St. Jodoc and the smaller church of the Abbey of Geligenthal, in the same town, are also worthy of notice.

A few miles further, on the Munich road, is Moosburg, with a large Romanesque minster. The church is exceedingly plain, but contains one of the most superb old high altars in Germany. The reredos is carved in wood, and is nearly 60 feet high; the whole is richly decorated with gilding and colour. The doors of the small shrine are painted by the elder Holbein, and there is a large picture of the "Carrying of the Cross" at the back of the altar. An inscription, let into the wall of the choir, records the fact that this altar was given by Louis "the Rich" in the year 1464. There is a very elaborate set of stalls of the same date as the high altar, and two fine monuments of the earlier part of the sixteenth century, carved in red marble. The church has been restored and decorated at the cost of about £12,000., which has been raised in the town by the exertions of the parish priest, who cannot be too highly praised for the zeal and judgment which he has displayed in this good cause.

Augsburg is, perhaps, the most dignified-looking of all the German towns: its wide streets, noble houses covered with frescoes, and lofty towers, give it an air of importance and grandeur superior even to Nuremberg. The "Carolinen," "Maximilian," and "Jacobs" Streets are amongst the noblest in Europe. The churches, however, are inferior to those of Ratisbon or Nuremberg, and have suffered terribly from modernization. The Cathedral is not a grand or imposing building, but is, nevertheless, singularly interesting. It consists of a nave erected in the year 995; western choir and transepts, partially of the same date; two square towers at the east end of the nave, of Romanesque work; and a fine lofty eastern choir, with aisles "chêvet," and surrounding chapels of good fourteenth-century work; the aisles and vaulting of the nave are also of this date. What, however, most deserves our attention is the valuable and interesting furniture contained in this building. In the apse of the western choir, immediately to the rear of the altar, is a marble throne supported upon the backs of two lions; this is evidently a very early work, and may date as far back as the eighth century. On the south side of the same choir is another throne, of late Romanesque work, over which is a stone canopy supported upon columns, the shafts of which are decorated with carved foliage and reptiles. The altar is placed in such a position that the celebrant faces the congregation when saying mass; it is surmounted with a lofty reredos of bronze, erected between the year 1321 and 1346. There is a good set of stalls, of late fifteenth-century work, and a metal screen separating this choir from the nave. In the clerestory of the nave are four stained glass windows, which are supposed to be the work of the tenth century; they are evidently very early indeed, and are probably the oldest specimens of stained glass in existence; the drawing of the figures is exceedingly rude. Hung from a boss in the centre of the nave is a most magnificent chandelier of gilt bronze, bearing the date 1346; it is of large dimensions, and in a perfect state of preservation. Against the pillars of the nave are eight altars, the reredoses of which contain most magnificent old pictures; four are by the elder Holbein, and the other four by Zeitbloom. The south doorway of the nave contains the celebrated bronze doors; they are works of the tenth century. The eastern choir contains a modern high altar, with the remains of an ancient one worked up into it; a most elaborate set of sedilia; and a double row of stalls on each side, the backs of which are hung with stamped leather, the patterns of which are picked out with vermilion and gold. Five of the chapels surrounding the choir retain ancient reredoses to their altars; they consist of triptychs, enclosing pictures or subjects carved in wood. They were executed during the first few years of the sixteenth century by Zeitbloom, Burckmair, and Erhardt; they are exquisitely beautiful, and make one regret that oil pictures are now so little used as decorations to churches. There are several fine monuments, some wonderful late metal-work screens, and a little old stained glass, in the Cathedral. The cloisters are interesting and full of old monuments.

The Church of St. Ulrich is an immense late Gothic building, 318 feet long, 94 broad, and 100 to the vaulting. It contains several fine oldpictures; amongst others, a " Madonna," by Martin Schongauer; some good stained glass; an ancient wooden altar, with a lofty reredos; and in the sacristy two very early crosiers, and one or two reliquaries of carved ivory.

The Lutheran Church of St. Anna contains a series of splendid cinque cento monuments; an organ with triptych doors, painted by Lucas Cranach in 1512; several very interesting pictures by Burgmayer; and the original portraits of Frederick of Saxony and Martin Luther, by Lucas Cranach. Most of the other churches in the town have been modernized or rebuilt during the seventeenth and eighteenth centuries.

Time will not permit me to give any description of Freising, Munich, Amberg, Passau, and Straubing, nor can I attempt to describe Prague; for were I to do so, I should have to detain you here another hour. There are very many other places of interest that I cannot even name.

In conclusion, I take the liberty to state two opinions, which you will accept for what they are worth. First, that Germany was far later than England and France in the adoption of Pointed architecture, and that in the south-east of Germany Pointed architecture did not develope itself from the Romanesque, as was the case in the north, but was introduced fully formed. The second is, that Pointed architecture was first used in the north-west of Germany (probably in the city of Cologne itself), and gradually spread to the south and east; but a century and a quarter elapsed before the Germans could be converted to this noble style of architecture.

Mr. C. F. HAYWARD, Fellow.—I have had immense pleasure this evening in listening to what Mr. Brewer has said, because I have been able to follow in my own mind, step by step, pretty nearly the route, and note most of the buildings and towns he has mentioned. I have nothing, however, to add to the information which he has given us (for it is some years since I went over the ground, and I afterwards embodied all my notes in a paper read at this Institute) in much greater detail than we could have expected from a gentleman who does not profess the art of architecture, but rather has pursued it with a view to making such drawings as we see before us—such, indeed, as deserve special acknowledgment at our hands. I have the greatest pleasure in proposing that we give him a hearty vote of thanks, which I am sure will be accorded most fully by the Meeting. I could bear witness to almost all that he has said with reference to the great extent of architectural work and picturesque building yet remaining in most of these towns, but more particularly with regard to the somewhat out-of-the-way town of Wertheim, and others on the river Main which are seldom visited, and which I have hardly ever heard described before. The remains of the Castle of Wertheim very much resemble those at Heidelberg;

the way in which I became acquainted with it was a much more pleasant one than is now possible—when the railway takes one in about two or three hours' time from Frankfort to Würzburg. The railway was not made at the time I speak of, and the usual course of travel was by the Maine, starting from Asschaffenberg, fifteen miles beyond Frankfort. The stream winds so extensively, and runs so strong, that it took a steamer two days to go from Asschaffenburg to Würzburg, but only one day to return with the stream. The first day's stoppage was at Wertheim, and I was so charmed and delighted with the place that I missed the steamer purposely on the next day, sacrificing the rest of the water journey, not without regret, for the sake of the opportunity of exploring the buildings more than I could otherwise have done. There is not only this particular town, but a number of little villages on the river which are full of picturesque mediæval work; and on this account I scarcely enjoyed the architectural tour of the Rhine so much as that of the Maine, not, of course, because the Rhine is less rich in architectural beauties, but simply because one hardly expected to see so much upon the less noted river, and therefore the surprise was the more agreeable. In such tedious travelling as by the steamer against the stream, and following the many bends of a river, winding very considerably, of course one had the opportunity of making sketches while on board the steamer, which could not be got by the present mode of travelling. Without, however, detaining you further, I will merely propose that we give our cordial thanks to Mr. Brewer; and I only wish there were many other gentlemen who studied as earnestly as I know he has, from the first time that he began to sketch with such success these architectural subjects.

Mr. J. P. SEDDON, Hon. Sec.—I wish to have the opportunity of seconding this vote of thanks to Mr. Brewer; but as I have not travelled over the ground he treats of, I have very little indeed to add to the remarks made by Mr. Hayward. Mr. Brewer has certainly whetted our appetites to follow the same route, and to see some of the interesting things that he has described. Looking at his two beautiful drawings of Bamberg, they remind me exceedingly of the town of Limburg, where we find, surrounding an almost equally fine cathedral, similar houses of the most picturesque forms, but in that town, unfortunately, there is hardly any of their original wooden construction now visible, it being all covered over with plaster and whitewash, or slating, so that Bamberg is comparatively fortunate in retaining so much, and Mr. Brewer tells me this is even more the case the further you go east and south in Germany. Nevertheless, I fear that it must be accepted as a lamentable fact that this class of building is being swept away as fast as the money can be got to do it with, so that our thanks are doubly due to those artists who, like Mr. Brewer, are preserving some records of them for the future. In speaking of the porches of the churches, to which reference has been made, I do not know that I have seen such fully developed examples as those mentioned; yet, I was very much struck with many that I saw in some of the more northern churches. Very often it is only from the plan that their original effect can be guessed at, as they have been so commonly severed from the church and their arches built up. The architect can, however, restore them in imagination, and he can therefore realize how that entering the church through two or three aisles, as it were, from the west end, the picturesque effect of such spacious narthexes, together with the complicated galleries, give a great charm to the interior of these German churches. I certainly have seen enough to lead me to come to the same conclusion as Mr. Brewer has with regard to the plaster. I believe that in those days they did cover over their buildings, dressings, rubble and all, with a thin coat of this material; and so what they must have looked like, unless they did paint them with frescoes, I could hardly say. Of course, the buildings look very picturesque now that it has become weather-stained and partially fallen off. I have only to add that I most cordially second the vote of thanks to Mr. Brewer.

The CHAIRMAN.—Gentlemen, it remains for us to accord our thanks to Mr. Brewer for his unusually interesting paper, which I am sure must have caused a desire in a great many here to go over the ground which he has so ably pointed out to us. I know that some few of us have done so, and others have partially explored the field of Mr. Brewer's labour, but probably there are none who have bestowed upon it more thorough and exhaustive research. We have rarely, if ever, had presented to us such an interesting set of architectural sketches and results of observations as we have had this evening. Whether we notice the pencil drawings, or those executed in colour, I am sure we shall be equally struck with the artistic feeling, tenderness of treatment, and accuracy in the representation of architectural detail which they exhibit. Mr. Brewer has, in point of fact, suggested a most valuable field of research. He has pointed out a district which, as yet, is comparatively little known, and one which will evidently gave great pleasure to all architectural students to travel over, either in part or wholly, as Mr. Brewer has done. I have most sincere pleasure in putting to you the motion for a vote of thanks which has been proposed.

The cordial thanks of the meeting were then accorded to Mr. Brewer.

THE TERMINUS OF THE MIDLAND RAILWAY, NEAR KING'S CROSS, LONDON.

By Professor DONALDSON, Hon. Sec. For. Corr.

I VENTURE to call the attention of the Members by a few words to what may be considered one of the most important works now carrying on in our metropolis, vast in extent—for it will cover seven acres—and gigantic in the proportions of its terminus shed. This grand feature is distinguished by a construction which, as to boldness and ingenuity, reflects the highest credit for conception and execution, on its eminent engineer, Mr. W. H. Barlow; on Messrs. Waring, the contractors; on Messrs. Ordish and Le Feuvre, who designed the details of the roof; and on Mr. Alleyne, of the Butterley Iron Works, who arranged the travelling, staging, and hoisting gear for the purpose of fixing the roofing in its place.

The roof of the terminus shed is 690 feet long, and has a clear span of 240 feet. The main ribs, which are 29 feet 4 inches apart from centre to centre, are latticed, and 6 feet deep, forming the curve of four-centred pointed arch, the radii being 57 feet and 160 feet respectively, and rising to the height of 96 feet above the level of the platform. The feet of the ribs cover a remarkably small area, as though they stood on pins; but here at the springing, instead of being latticed, they have plate webs and are let into a shoe, which spreads out on each side and to the projection of a buttress, so as to give a firm footing, and these shoes are bolted down to anchor plates at the foundation, built into the wall to ensure further stability. Except the shoes, the whole consists of plate iron, three intermediate ribs between the main ribs being of rolled iron, I section, 10½ inches deep. There are at regular distances on the sweep of the roof trussed purlins to carry the intermediate ribs, and so constructed that they stiffen laterally the lower flanges of the main ribs. In the whole height of the roof there are no ties, the sweep being so adjusted, and the weight so distributed and equipoised, that the series of girders, about 2 feet deep, extending across the station at the level of the floor, are sufficient to retain the feet and resist the tensile strain at that point upon the ribs.

The floor is also designed with considerable ingenuity, and merits our attention. The whole area, 690 feet by 240 feet, is upheld by a series of cast columns, 14 feet 8 inches apart from centre to centre, and 15 feet high, and on the caps are the transverse girders already mentioned and a series of longitudinal girders. The vaulting, if it may be so called, of this basement story or ceiling rests on this net-work of girders, and is formed of Mallet's buckled plates securely fixed to the girders, and thereon comes the floor. Thus it will be perceived that the columns afford clearer space for stowage beneath than piers would have done, and the buckled plates are lighter and more sure in construction than brick vaults.

The ribs and roofing are erected and fixed in place by means of a travelling staging and hoisting gear. The system on which Mr. J. G. N. Alleyne, of the Butterley Iron Works, has designed the staging is, that the main rib is never lost hold of until all the wind-ties are finally fixed to the walls. The staging is divided into three sections, the centre consisting of six divisions, the side ones of five divisions each, and from front to rear there are four divisions. The standards consist of die-square balks of timber, 12 inches square; the horizontal traverse pieces are double, 12 by 6 inches each, except the lower one, which is 12 inches square, with iron shoes bolted down to receive the feet of the standards and braces. The cross braces are 12 by 12 in the two lower tiers, 10 by 10 inches in the two next tiers, and in the upper ranges 9 by 9 inches. The wheels, on which the three sections move, are 2 feet 8 inches in diameter, and run on a balk of timber 18 inches square; altogether, there are 123 wheels under the staging. Of course, the three divisions of the staging can be moved, and are moved distinctly and separately; but when main ribs are being hoisted and adjusted, they are all three bolted together at each horizontal timber with wrought-iron clamps and bolts, and screwed firmly together against a chock of timber. Each gallery of the stage is fitted with two slides, which are forced outwards against the rib by folding wedges, so that the work can be adjusted to the greatest accuracy.

For moving the staging the following process is followed. When, in the first instance, two ribs have been fixed and the riveting finished, and everything is properly adjusted, the folding wedges of the two side stages are knocked out; the rib, in taking its proper deflection, rests firmly on the centre compartment; the wedges of this are not disturbed, the whole centre compartment being kept bolted down to the floor. The slides are drawn inwards, and the side divisions of the staging are moved, so that the slides originally opposite to No. 1 rib are brought to be opposite No. 2 rib; they are then wedged out and hold No. 2, and are in turn bolted down to the floor. The wedges of the centre compartment are now removed; it is set free from the floor, moved up to No. 2 rib, and the three compartments or divisions are bolted together as before, and are then ready for No. 3 rib. The sides may be moved in about thirty minutes each, and the centre in ten minutes. These movements may be effected by hand-power of three men with iron bars to each wheel. For hoisting steam-power is used. The derrick employed for the purpose is arranged with an universal joint, so that it can be raised, lowered, or twisted round in any direction. The steam crab is furnished with a double warping barrel, so that the rope does not accumulate on it—a system first used, probably, at the Exhibition in London, 1862.

ERRATUM.

In the last Sessional Paper, No. 7, p. 5, for the name of *J. W.* Papworth read *Wyatt* Papworth.

6. Quadrant; Buxton
~~Brighouse~~;

Mar 26th 1868

Sir/

By Mr. J. P. Seddon's direction I send to you by Book parcel MS. of my Paper on Denton Church to be got into type in readiness for its delivery before the Royal Institute of British Architects on Monday Eg. next; & I hope you will be able to let Mr Seddon have the proofs early on that day. There are a few sheets to add which I will forward either by tomorrow's post or defer sending until after the Meeting. Please acknowledge the recd. of the Paper to me here & oblige Yrs. truly

Charles Barber

Mr Davy.

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 30th March, 1868, J. CLARKE, Vice-President, in the Chair, the following Papers were read:—

REMARKS ON ALL SAINTS' CHURCH, DARTON.

By FAIRLESS BARBER, ESQ.

IT would be great presumption in me, who am not an architect, to come before the heads of that profession with a purely Architectural paper, and it is necessary that I should explain in the outset, that it is only in the humble capacity of Honorary Secretary to a local Archæological Association, that I venture to offer for consideration this evening the result of my examination of the Church at Darton. It was by a letter in the *Times* Newspaper in September last, with reference to restorations in progress there, that I was first attracted to the place, and I have since that time visited it twice, and made some researches into the history, not only of the church, but also of the living; these I have either omitted from my paper, as foreign to the purposes for which your Institute holds its meetings, or condensed, so as to give in mere outline such historical facts only, as may contribute to a better understanding of the building itself; and I have added for the purpose of inviting discussion on the subject, such remarks as occur to me on church restoration, considered from an archæological point of view.

Darton is a small village on the west bank of the river Dearne, about three miles to the north of Barnsley; it was formerly part of the Laci fee, and from the researches of the late Rev. Josh. Hunter, F.S.A., it may be inferred that a church was built there sometime in the 13th century, either by John de Laci, Earl of Lincoln, or his subinfeudatory Sir John de Sothill. At any rate the presentation to a church there remained in the Lacis, when Earl of Lancaster, passed from them to the King, as Duke of Lancaster, and was in royal hands until the reign of Richard III, who in 1483 granted the living of Darton to the Friars predicant of St. Mary Magdalen de Lunda, at Monk Bretton or Burton Abbey, in exchange for the Forest of Halcombe in Lancashire. This grant to the Friars was set aside by the Act of Resumption, passed on the accession of Henry VII., who retained for some time both the forest and the living, but on a petition to Parliament setting forth the facts, restored the latter to the Friars.

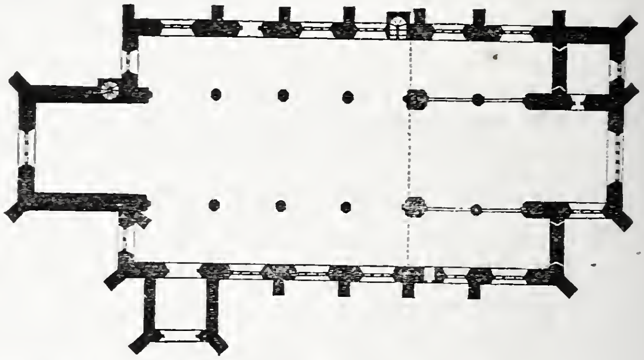
It is to these Friars and the influence exercised by them through their vicar, that I attribute the erection of the present fabric; for the dates to be assigned to the various parts of it, correspond with the period, from the date of the first grant to them in 1483 to the year 1517, when their Prior, Thomas de Tykyll placed the following inscription on the wall plate of the chancel—

> "Ad Laudem Dei et Omnium Sanctorum istum Cancellum de novo construxit, Thomas Tykyll "Prior Monasterii Monk Brittaniæ, et hujus ecclesiæ patronus; et eundem complete finivit Anno "Domini Millesimo quingentessimo decimo septimo."

This view is also confirmed by the changes in plan which are observable on a close examination. Thus we find the tower, built as I suppose immediately after the grant of Richard III., constructed independently of the rest of the church; with the west wall of the north aisle of ruder masonry, and said to be a part of the earlier church, in no way built into it; and the west wall of the south aisle, which is as late as any part of the church, so built against the tower as to leave the S.E. angle buttress within the church.

Since completion, the church has remained substantially the same, and I will now give a detailed description of it.

In approaching Darton Church for the first time, the freshness, solidity, and simplicity of the structure are most striking. The well-squared masonry is most noticeable, and this and the plainness of the mouldings which prevails inside and outside, from tower to chancel, are features quite in accordance with the somewhat coarse but very durable sandstone which the builders have, with an exception to be noticed hereafter, used throughout the whole church.



The style is the perpendicular and the plan simple, consisting of a well proportioned clerestoried nave of four bays, opening its full height to the square tower at the west, flanked on either side by N. and S. aisles, and separated from a lofty chancel of two bays by a chancel arch. The N. and S. aisles are continued as N. and S. chapels in the chancel, from which they in like manner are separated by arches, and the chancel itself is continued its full height some 12 feet beyond these chapels.

Throughout the arches are all pointed and of two orders; in the chancel arch and in the arches of the chapels, and within the chancel, the outer edges of each order are simply chamfered, while in the nave and tower arches an ovolo is substituted for the chamfer. But although this similarity of character prevails in the arches, they have been made on the hands of the ingenious builders susceptible of considerable variety of treatment. Thus, the chancel arch and the arches springing E. and S. and E. and N. from the same piers, spring from simple brackets, showing in the section five sides of an octagon, and relieved in those supporting the chancel arch by a delicate nail-head moulding, which the recent removal of whitewash has revealed to the present generation, and which the chisel has fortunately passed over without injury. Again, in the arches in the nave springing from the same piers as the chancel arch, the impost of the upper orders is continuous with the piers, while the lower order is made to spring from semi-octagon pillasters on the surface of the same piers, and other arches are also thus treated. The piers, excepting those at the junction of the nave and chancel, which are plain masonry, are, as above stated, octagon columns with moulded octagon abaci and plan bases, either of the same character or square, with the angles in the latter case filled with neat chamfer terminations of excellent workmanship. The tower arch, the apex of which coincides with the centre of the roof of the nave, is very lofty, and although somewhat more pointed than the other arches, strikes the N. and S. walls of the tower at a slight angle, which breaks the continuity of impost that would otherwise occur. Through this arch the whole of the interior of the tower is visible to the floor of the ringer's chamber, and through it also are seen from almost every part of the church, the west window and door, the proportions of which are most admirable, and greatly contribute to the impressive effect of the view in this direction.

Here must be noticed the uncertain treatment of the piers at the extreme west of the nave, which has evidently resulted from the tower having been built and probably completed before it. As will be seen at once, the S.E. angle buttress of the tower occupies its position *now* within the church as an independent feature, into which the adjoining arch has been built, and from which part of the base mould which is continued through the present west wall of the south aisle has been cut, to make way for a square flat pillaster with moulded abacus, double the width requisite to receive the arch, and made possibly of this width to give additional strength to the structure of the tower.

At the N.E. angle of the tower, where the position of the belfry staircase has rendered the continuation of the angle buttress to the ground unnecessary, an exceptional treatment is also at once observable.

The window arches also display some variety. That of the west window in the tower alone is pointed; those of the clerestory and in the north and west walls are square, while those of the east window, north and south chancel windows, and of the windows in the south of the church are four-centred arches; those of the south aisle being somewhat flatter than the others. The east window is of five lights, intersected crosswise by a transom, dividing each light equally into upper and lower portions; the heads of the latter are slightly curved and of the former are all cinqfoliated, the three central ones being also ogees, from which rise additional vertical mouldings. The windows of the clerestory, and the west windows of the aisles are of two lights, and the other windows in the church are of three. All have very plain mouldings and exhibit only the ordinary forms of perpendicular tracery. The north chancel window and the east windows of the side chapels have been walled up with ashlar to provide space within the church for the monuments, by which they are now blanked.

There are four doorways; one at the west in the tower; a pointed one, a second in the first bay of the south aisle, also pointed, and still approached by the original porch, itself entered by a pointed arch; a third, also on the south, being a small priests' door in the south wall of the south chapel, and partly blanking one light of a window there, and the fourth a square one without porch in the second bay of the north aisle. Of these doorways, the west alone merits a detailed description. The mouldings commence from a dripstone, (on the hollow of which four roses are carved at equal distances) with ogees reversed, then a deep circular hollow, and then the same reversed ogees repeated. These mouldings have no bases, but rise directly from a plain chamfer almost close to the floor level.

The dripstones over the south doorway and the porch arch terminate with carved human heads, the latter much defaced, but on the former the coiffure of the lady on the east side still displays the crespinette of the Tudor period. These carved heads are of magnesian limestone, and with the carvings terminating the dripstone of the clerestory windows, form the exception to the otherwise universal use of sandstone above referred to. In all the doorways, the original doors more or less patched by irregular repairs, remain.

The carvings on the south side of the clerestory are very striking; the whiteness of their stone contrasts strongly with the warmer grey of the walls, and the workmanship is so much better and more artistic, and the costume where it occurs so much earlier than the rest of the fabric, that the impression at once arises that they must have formed part of the decorations of the earlier or some other church or building, and been carefully preserved and introduced as they now appear. The corresponding carvings on the north side are also of magnesian limestone, but are so inferior that they cannot be ascribed to the same period. They may be humble efforts of the less artistic builders to produce corresponding results, or still later defacements of original sculpture, the subject or character of which had become objectionable.

The base moulding is throughout a shallow ogee of considerable strength, and has evidently been copied from the base mould of the tower, from which however it is wholly disconnected. This fact, and the variations on the level of it which occur at different points, and are met by a drop in one point on the north side, followed by a rise in another on the south, go strongly to prove that all the walls, except the west wall of the north aisle, which has no base mould, are later in date than the tower; while the junction of the nave arches as above described leads to the same conclusion as to them, and the inscribed date on the wall plate of the chancel is further conclusive as to that portion of the work. It would of course be easy to infer that the nail-head moulding in the chancel and the earlier mouldings of the nave arches were a sign of earlier work, but so far as the plaster has been removed, nothing has been disclosed to show any break in the masonry except in the west wall above mentioned, and the nail-head moulding, if not preserved as previously suggested from the earlier church, may have been copied as an ornamental enrichment from an earlier model, in order to reduce the contrasted plainness of the masonry, near the richer carving of the rood screen.

The walls of the tower are unbroken by any stages, unless a plain moulding, about mid-way up the ringers' chamber, and carried over the three square openings by which it is lighted on the east, south, and west, can be considered as dividing it into two stages.

The tower is embattled, as are all the walls of the church, and the four angle buttresses are carried quite to the top, where they terminate in pinnacles roughly crocketed. An intermediate smaller pinnacle, of like character, rises from the embattled parapet in the centre of each side.

The belfry windows on all sides are the same, and, notwithstanding the winds and beating rains of four centuries, are still comparatively perfect. The belfry may be fairly considered the most beautiful part of the tower, as the tower itself is of the church. It contains six bells: the fullest inscription on any of them is as follows:—" Lester, Pack, and Chapman, of London. *Fecit* (sic) 1769. The Rev. Joseph Leech, minister. Jn^{o}. Taylor, Jon^{a}. Roebuck, Jo^{s}. Hobson, Ch. Wardens." The bells are excellent; they still hang in the original frame, which is ingeniously constructed, so that each bell hangs at cross corners with the tower, and speaks directly through one or other of the windows.

The only external features yet to be mentioned are the buttresses which occur at intervals all round, and with one exception are of ordinary character. This is at the north-east corner, where, guided possibly by a lower roof line of the original north aisle, (an indication of which still exists in a piece of wall coping in the west wall,) the architect, having constructed his buttress for a lower height, has most ingeniously and effectively projected the upper portion of it, so as to make it conform to the present height of the north aisle. This special treatment confirms the statement contained in an entry made in the register by the Rev. John Heathfield, who was vicar before and during the Commonwealth. " There was an Old Church here, of which remaineth nothing but the End and Window joining the North Buttress of the Steeple." The window in its present form, of a small square-headed two-light window, has evidently been rudely altered, and is even now in a quasi-unfinished state. A curious excrescence in the fourth bay on the north wall, in the form of a flat buttress, will be found, on entering the church, to contain the staircase to the rood loft, the doors of which are now opened. On entering the church, the fine oak roof of the nave and aisles at once attracts attention. Flat massive beams, equal apparently to any possible weight, span the nave at each bay, and are on the upper side blocked up with solid timber, so as to give the roof a shallow pitch. These beams, where original, have been roughly moulded, and the mouldings on the ribs and carvings on the bosses are all strong, massive, and in good proportion, and add their quota to the general effect. The panels also are large, four being sufficient to span the nave, and two each aisle, and the boarding being alternately raised and sunk, gives them a broken surface. The bosses are peculiarly bold in design and carving, and bear some of them letters and monograms admirably executed. The whole of the roof is now stained a dark brown, but traces of gilding and colour are still visible on a double rose near the tower arch.

On the walls of the clerestory, plain corbels have been introduced, from which rise vertically, at the division of each bay, square oak beams of considerable strength, which bear similar beams placed horizontally upon them, so as to completely conceal the original wall plate, and cut in half the bosses next to it. On a close examination, it will be seen that this is not only a later addition to the roof, but also that it partially destroys the original effect, without apparently adding any support; for the horizontal beams have to be held in their places by stops nailed to some of the cross beams, to prevent them falling forward. This curious addition to the roof escaped the notice of Mr. Hunter, and it would be well if it could be removed, and the reason of its introduction explained. If it did not add support, the only inference is, that there was some object in concealing the wall plate which it most effectually hides; and as the roof is of a date when inscribed wall plates are found in the neighbourhood, as at Almondbury, there may be some legend here which, if revealed, would tell us whether it was objectionable or not in point of character or doctrine. The inscribed wall plate, still remaining in the church, gives additional probability to the existence of a similar feature in the nave.

But apart from what any possible legend might tell us, the carvings on the roof, as it appears at present, are very instructive. In addition to the monogram of the Saviour, which occurs on several bosses, we have in the north aisle a monogram of the Virgin Mary, combining in one character the three first letters of her name; a single letter I in the south aisle, and near it a legend containing many letters which cannot easily be deciphered without a closer inspection than has yet been possible; and a head, probably of St. John the Baptist, and the face with three eyes, two noses, and double mouth, the not uncommon symbol of the Trinity. And we have, moreover, some coats of arms, which give a clue to the individuals who were interested in the work. These are prominently the shield bearing three cups, two and one, the arms of the Priory of Bretton; a shield lozengy, a bend, for the arms of Rockley, then of Birthwaite; a shield bearing paly of four, a bend with three mullets, ascribed by Mr. Hunter to Dronsfield; and another shield on the side of the boss next the apex of the tower arch, which bears what appear to be three manchets, two and one.

The roofs of the north and south chapels are similar to those of the aisle; that of the south chapel being a modern restoration; neither bears any special marks to identify it with either S. Nicholas or (except the monogram above mentioned) Our Lady of Darton, to whom reference is made in documents relating to the church, and to whom they might respectively have been dedicated.

In the chancel roof we have a strong contrast to the massiveness of the nave, for here the panels are smaller and the ribs light and delicately moulded; the bosses also are proportionably smaller, and the boarding of the panels is smooth and even. Here, too, in addition to the inscription on the wall-plate already mentioned, we have a single cup from the Bretton shield, the Saviour's monogram, and the letter T, which was doubly the monogram of Prior Thomas de Tykyl. The carving here is excellently finished, and the letters as fresh and as well defined as when first executed. From the roof the eye at once falls on the single figure in stained glass in the centre light of the east window. It represents, as the legend at the feet states, the Magdalen (not the Virgin, as Mr. Hunter supposed,) with her long hair and cup of ointment, from whence, no doubt, the cups on the arms of the Priory are derived, but without any surrounding ornament. If other stained glass ever existed in this window, all trace of it is gone.

In the chancel is a small very plain piscina on the south side. There appears to have been a similar but smaller one in the north chapel, disclosed on the removal of the Beaumont pew, but now walled up. The vestry, approached from the chancel by a small door on the north side, exhibits some traces of alteration in the original line of roof, but does not call for further notice.

The screens separating the chapels from the chancel, though a little defaced in parts, are tolerably perfect; but the rood screen, which, from the bases disclosed on removing the pews, must have extended quite across the church, is entirely gone. It was approached from the north end by the staircase still remaining in the north wall, and must have projected some distance into the nave, to admit of the passage along it of the attendant; for the beam seems to have been fixed entirely on the nave side of the centre of the chancel arch, the ends striking the piers so as to destroy the western halves only of the brackets supporting it. There are, however, worked up into the old pews of the church sufficient fragments of the screen to enable a skilful architect to reproduce it. It is difficult now to imagine why it was ever removed. The order of the Ecclesiastical Commissioners of the third year of Elizabeth, and Archbishop Grindal's injunctions founded upon it, were directed only to the destruction of the rood and rood-loft and, if properly read, were specific in requiring the maintenance of the screen, as appears by the following provision :—" It is thus decreed and ordained that the rood-lofts, as yet being, at the day " aforesaid, untransposed, shall be so *altered*, that the upper parts of the same, with the latter, be quite " taken down, with the upper parts of the vaults and beams running in length over the said vaults, by " putting some convenient crest upon the said beam towards the church, leaving the situation of the " seats as well in the quire as in the church as heretofore hath been used."

The want of a screen is much felt, owing to the unbroken level of the church, and the eye casts about in vain for something to break the distance and give completeness to the design. If, as has been suggested, a pew, bearing the following inscription, was partly constructed out of the screen, we have a curious record of the date when, and the names of the persons by whom, the destruction was effected :—

" Without any blot this cost made Richard Haighe and Thomas Gelot the year of our Lord, 1579
" What ye say or do mark well the end."

When I first saw the church, all the seating and pews of every kind had been removed, but from some pieces left in the porch, and some most substantial but simple benches which I was taken to see in a field at some distance, it was clear what the character of the original internal woodwork had been.

The benches referred to are very simple and massive, of oak, and in good preservation; the seats are several inches thick, have inclined backs, and square ends, the edges of which are chamfered, but not otherwise carved or moulded; they had been placed close up to the wall as was evident by the patches untouched by whitewash, which the ends had covered. The great strength of these benches is quite of a piece with the workmanship of the nave roof, and it is to be hoped they will all find their way back again, although the different arrangement of pews shewn in the recent plans by which restorers are working does not appear to have so provided.

The whole of the interior has some years ago been plastered and whitewashed, and the successive coatings have now been in some parts removed by the chisel, under the direction of Mr. Perkin of Leeds, a Fellow of your Institute, who has also considered it right to pass a chisel over the piers and some of the mouldings of the arches. This has given to the interior of the church an appearance which altogether belies its antiquity, and must be a matter of regret to all who have seen plaster and whitewash removed by other means, without destroying an original well preserved surface.

A gallery at the west end has been happily removed, and on pulling down the staircase leading to it, built in as a wall stone, was discovered what I believe to be the stem of the original font; it is plain giving a quatre-foil in the section, and though slightly defaced on one side, is capable of being restored to its original use, on the addition of a suitable bason, in lieu of the uninteresting specimen of stone turnery which for many years has done duty as a font.

I now pass from details which, I fear, may have been wearisome, to consider—Firstly, what an archæologist is, and—Secondly, to draw a few inferences as to the relation churches bear to his peculiar work.

An archæologist is a student of history in its most comprehensive sense, with a special affection however for that portion of it which is illustrated rather by the works of man than by what is said of him in histories commonly so called; one who, as his name may be said to imply, searches out the beginnings of things and draws his impressions of any period from the things of that period; who rejoices in what the learned professor of modern history at Oxford has aptly described as " the breaking " up of the fountains of historical refreshment," which is now being effected under the direction of the

Master of the Rolls, and by Societies engaged in the publication of original documents, but who values still more highly every trace the mind of man has left in his works, which for vast periods are all that remain to tell of his existence, and from which more can be learnt and more effectively than from any record of the same facts.

The teaching power of any object that bears the impress of man's work is immense, from the flint arrow point found by the barrow digger in a prehistoric grave, to the magnificent assemblage of nearly all crafts and many periods to be found in some of our cathedrals. It is a law of the actual no less than of the moral world, that "we shall know men by their fruits," and any one who has given his whole mind to receive the impressions an object wrought by man is capable of conveying, will admit that the converse also is true—"without the works of man you cannot know man." And this is as true of the present as of the past; as true in architecture as in any other development of the human mind; as true of the "concrete mendacity"—to borrow Mr. Carlyle's expression—which some men now-a-days are pleased to call a house, as of the finest examples of the Art which any age has created for us.

This preference for objective teaching is not merely fanciful; it is based on a desire to get at the truth by seeking it in the surest way, and although such a course of study must beget a strong attachment for the objects upon which it is sustained, this arises, I venture to hope, because they *truthfully* express the result of the exercise of the human mind, and not from a mere reverence for the past, which borders on superstition, and has led great thinkers to confound great learners with mere virtuosi.

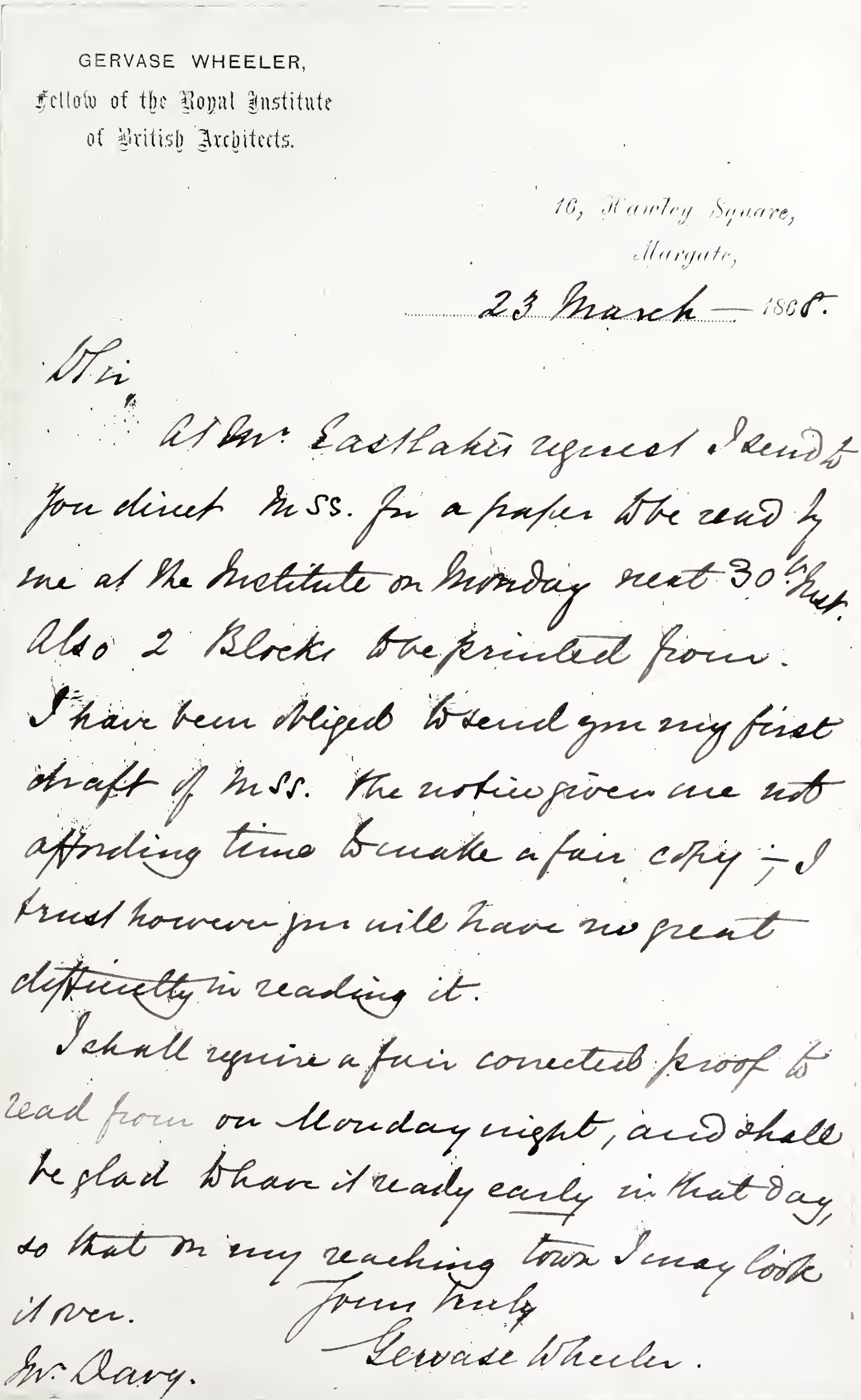
It would be easy to enlarge further on this part of the subject, and I hope it will not be thought I have said more than is necessary to repudiate for the real archæologist any connection with a mere collector, to whom anything is valuable so long as it is old, and because it is old. It is easy to infer from all this what a church is to an archæologist. Thanks to Mr. Rickman and to great architects who have studied their own science on the principles an archæologist would lay down, there is now, so to speak, a complete anatomy of church architecture, the value of which in assigning dates cannot be over estimated, and it should be a cardinal point with all who undertake the repair and, if I may use the word, the mending of churches, never to efface or deface any part which is so distinctive as to supply its own date, and which can possibly be spared without materially affecting the present use of the structure. It is really quite as barbarous to remove a well preserved original surface as it is to whitewash a decorated wall, and to deface an original moulding by recutting it, is, certainly to alter it, and, what is far worse, is to make it tell a lie in place of the truth it originally expressed. Some, I am aware, would draw a hard and fast line, and in restoring, cut out every addition made to a church since the Tudor period: in most cases little harm would result from this, for what would be thus lost is generally distinguished rather by the want of mental power displayed, and has to the archæologist only a negative value; but there are exceptions, and where real honest mental effort is discoverable in later additions to a church, the quality an archæologist seeks ought to be preserved in these no less than in earlier works.

A main difficulty in church restoration is no doubt a want of style; in earlier days we find extensions made in the style of their own period, and we applaud rather than blame the restorers, but an architect would be rather puzzled now-a-days how to execute a church extension or restoration commission in the style of the XIXth century; nevertheless, it would be well if he could do so, and leave something that would stand, and was worth preserving, for future enquirers would then be able to say that the church styles of this age were not all mere reproductions of earlier types. It is beyond the compass of my paper to pursue this subject further, and I would close it by asking the Institute to join with me in rejoicing that so fine a monument of its special class as Darton Church should remain so perfect externally, as to need scarcely small repairs, and in regretting that internally it should have been, I may almost say, gutted; old work, some transposed, some discarded, while the patron, with his own workpeople, and without, as I believe, the active intervention of an architect, is pursuing his own views of what is most pleasing to himself.

Mr. SEDDON, Honorary Secretary: I beg to propose a vote of thanks to Mr. Barber for his valuable paper. Such a communication is of greater interest as relating to a church which, as he has explained, has become somewhat notorious on account of the manner in which it has been treated—I cannot call it restored. It would indeed be a fortunate thing if, wherever churches are about to be restored or altered, some gentleman equally competent would give a similar careful description of it, to that which Mr. Barber has done of this one. I never myself met with an instance of bells being hung in the way Mr. Barber has described those at Darton to be; it appears to me, however, that such must be a most admirable method, particularly where the windows of the belfry are small, for it would enable the bells to speak more effectively than under the ordinary plan. With respect to the retention of wood screens, we very seldom find them retained as fully as the law seemed to contemplate they should be; and sometimes it certainly has been very difficult to know what to do with regard to them, for although in some cases they intercept more of the view of the chancel than one would wish at the present day, at the same time they are perfectly useless anywhere else, and as they are objects of interest I think they should never be removed. I beg to propose a vote of thanks to Mr. Barber.

The CHAIRMAN: Mr. Barber has given us a paper which will interest us very much, and especially in the Conservation Committee on the Preservation of Ancient Monuments, and if Mr. Barber can suggest any means of remedying the evil of which he complains we shall be happy to adopt them. I am sure the Institute will be pleased to pass a unanimous vote of thanks to Mr. Barber for the interesting paper he has given us.

The usual vote of thanks was then passed to Mr. Barber for his paper.



DOMESTIC ARCHITECTURE IN AMERICA.

By Gervase Wheeler, Fellow.

A Supplement to the Paper read on the 3rd February, 1868.

In accordance with a general request, I have the honour of offering some supplementary remarks to the paper previously read in this room. I propose to confine myself, as nearly as possible, to the questions presented by members, and I take this opportunity to respectfully record my thanks for the cordial manner in which my first essay was received, evincing so warm an interest in the subject selected for discussion.

I have prepared plans and drawings to accompany the present brief remarks,—some of which are now before you in roughly enlarged diagrams, and others are to a smaller scale. The series of drawings to which I would call attention represent an ordinary New York up-town house, such as may be counted by hundreds not only in that large and fashionable city, but in all other new towns of the Transatlantic Continent, remarking by the way that it is not offered as an example of what would suit our own mode of living, but as a specimen of the domestic buildings of America.

I will not travel over the ground occupied by our former discussion: suffice it to say that the plan itself is a type of the class of private residence known as the "high-stoup," or genuine New York house. It is built upon an ordinary lot of twenty-five feet frontage, and its arrangements present all the peculiarities of an American city dwelling. You will notice that the block plan of the house shows a very considerable depth—occupying in fact nearly the whole of the lot, and that it is recessed more boldly from the line of pavement, or side-walk as Americans call it, than our London houses generally are. This recess gives a better opportunity for the entrance steps and landing, which, as I have told you, are wide and handsomely arranged, the upper level forming a porch or "stoup," which feature gives the name to this kind of house. The hall door leads into a vestibule, in which are inner glazed doors opening into the entrance hall. Upon this floor are the reception rooms,—differing from our customary arrangement which disposes them upon the floor above,—and these rooms consist of one very long saloon, divided by columns into two equal divisions, and in the rear is a drawing room occupying the whole width of the house. Beyond this room—the American name for which is an "Extension room" —is a wide piazza enclosed with glass, and having steps leading to the garden. For party purposes the whole suite is thus extended to a very considerable space, the reception rooms being together about 49 ft. by 16, and the extension room nearly 24 ft. by 20, with a piazza of 10 or 12 ft. more. The drawing room is divided from the saloon by sliding doors, which shut into the wall when required, and are filled with ornamental glass.

Between the staircase hall and the extension room is an inner hall, shut off by sliding doors, and containing a "lift" or dumb waiter from the service room below, enclosed shelves and other conveniences for the use of serving refreshments. This is lighted by glass in the sliding doors in the day-time, and by gas in the evening, which is of course the time when principally used. The height of this story is 14 feet, and the staircase is carried up in one continuous flight without the break of intermediate landings.

The floor below is thus divided:—

In front is the dining room, forming the general living room of the family, and corresponds in size with the reception room over—24 feet by 16. In rear of this is a large private store closet, and also a serving room, which communicates directly with the kitchen. The kitchen itself is of considerable length, the rear end being fitted with washing troughs and other conveniences for laundry purposes. A glazed door leads from this into an open space beneath the piazza, and in the floor of this are apertures filled with sheets of rough heavy glass to assist in lighting the cellar below. By the side of the laundry are a servants' bath room and a water closet, and the space not occupied by the staircase is filled with a store room and several closets, American housekeepers always preferring a large number of separate enclosures, in which their necessaries may be kept distinct, to a general store room. This story is 10 feet high. Beneath this floor is the sub-cellar, which is always kept as little obstructed by cross walls as possible. The heating apparatus, whether furnace or boiler, is in the centre, with large coal bunks in front; the rear being left open with larder, milk room, and the like at the side. The heating apparatus I will presently speak of, merely calling attention to the large air trough carried under the ceiling and opening into the area in front, by which cold external air is conveyed into the heating chamber, and thence distributed over the house.

The chamber floors are above the reception rooms, and are arranged exactly alike in each story. One large room in front, a similar chamber in the rear, and smaller ones at the side; that at the back containing a bath and water closet, with a large linen closet, the peculiarity of which is that it is lined with cedar to keep blankets and furs from ravages by moths. Between the two large rooms a considerable space in the middle of the house is devoted to dressing closets, which are so arranged as to contain washing and bathing apparatus, hanging wardrobes, drawers, and all other fittings for toilette requirements. These are, moreover, lighted and ventilated by an air shaft, which runs up from this floor through the building, with a cover of thick glass raised a few inches above the level of the main roof, having apertures at the side with closing shutters for admission of air at will.

The section will show that there are three such chamber stories, of the respective heights of 11, 10, and 9 feet, and that in the rear the peculiar construction of the long sloping roof gives an additional story over one half, and affords sleeping rooms for servants.

Although other forms of roofs may be seen, this mode of construction is that generally adopted. Its simplicity, and the ease with which snow or rain can be conducted to the one large overhanging gutter in front, give it advantages which the lightness of the covering used—tin, enables American builders to avail themselves of. The bearings are principally on the side walls by means of stout purlins, and the rafters overlap and are pinned together in breaking lengths, and tied at the foot to the ceiling and floor joists, forming in reality a series of individual trusses from one end of the building to the other.

The gutter is formed in tin, and is carried upon very bold brackets, the front being treated as a cornice. This part of the front of the house is generally of wood, and very stoutly and strongly framed. I know this part of an expensive and often elaborately ornamented front *ought* to be of stone, and many who have only taken an ordinary peep at American town houses will believe that it *is*, but recollections of actual fact compel me to say that the American workmen paint and sand wood work very cunningly, and all must not be taken as stone which looks, nay and even feels, like that more orthodox material. But it must be conceded that for this particular purpose wood is a good and proper material; the error is in making it appear what it is not. Iron, which has been occasionally used in this situation, has not, I fancy, found general acceptance—at all events it had not to the date of my last personal experience in America.

The average cost of building such a house as the one above described, with a stone or marble front, and handsomely but not over elaborately finished, would be, exclusive of the land, about three thousand guineas. The land, especially in some exclusively choice localities, would often be nearly as much again, and the rental of such a residence would not be less now than from six hundred to eight hundred guineas per annum,—in some situations very much more. The cost to purchase would be from six to ten thousand pounds. Houses built a few years back, and in the less fashionable parts of the town, may be bought for much less than these amounts; and in many very pleasant situations, not so exclusively "the rage," such can be obtained at more reasonable, though still very high, rentals.

A wish having been expressed for further information as to the modes of artificial heating employed in the United States, I will endeavour to describe the various apparatus most commonly in use.

Stoves, fire-places and the like, serving to heat only one apartment, I will pass over, and confine myself to such systems as provide warmth to the whole building.

The first of these is the hot-air furnace, by which air brought from without is warmed by contact with a large heated metal surface confined within a chamber of brickwork, and then distributed through tin pipes of large diameter to the floors of the several rooms above. This apparatus is placed in the cellar, and being comparatively inexpensive and very easy of arrangement, until a very few years back it was in almost universal use. Unfortunately many serious objections were found in the working of the system, which, however, I am inclined to attribute to defects in the apparatus and in the mode of its application, rather than to the principle itself. Hot-air furnaces there are of American make, both good and bad; and the bad being cheaper, and the people on the whole not understanding wherein the advantage of one piece of mechanism consists over another, the country has been overrun with cheaply made red-hot cast-iron appliances, that burn up and vitiate the air, discharging currents into the rooms highly charged with sulphureous and other irritating gases, justly bringing upon their use the condemnation of medical men. The pipes, too, are often contracted in their dimensions, and instead of the warm air chamber gently giving out large volumes of moderately heated fresh external air throughout the building, a thin scorching blast of air, almost red hot, is shot through the registers into the rooms, to the destruction of all health and comfort. So great a nuisance this became at last, that a general outcry was raised, and hot air furnaces are now, I am told, not nearly as frequently used as they once were. But experience and a loving attention to a subject, always somewhat of a hobby, have satisfied me that the old Boston furnace of *Chilson's* principle, or its improvements and modifications introduced by *Boynton*, the New York successors of the original house, may be used in such a manner as to answer all the requirements of modern modes of heating.

Recent testimony from New York leads me, however, to conclude that furnaces are less frequently in demand, and the more costly modes of hot water and steam heating are supplying their place; still, with many instances fresh in my recollection, and the disinterested accounts of their continuance in satisfactory working, I do not feel inclined to admit that the evils of this mode of warming are identified with the system, but rather result from bad workmanship and improper application.

The best furnace that can be used is one which gives the greatest possible amount of heating surface, and at the same time is of such simplicity of construction as to readily allow its internal parts and flues to be frequently got at and cleaned. Its parts should consist of a large fire lined pot of very heavy casting, and above and surrounding that the flue subdivided into such forms as will best multiply the heating surface, and ultimately discharge the smoke into the chimney flue as cool as possible, so that all the heat may be transmitted by radiation. All these parts are enclosed in an air chamber of brick—which must be of large size, and of double walls so as to allow no waste of heat into the cellar. The cold air is brought by a wide wooden trough from the exterior of the building into this air chamber, and after passing over the several heating surfaces, is carried by means of tin pipes, varying in diameter from 8 to 14 inches, or even more, according to the size of the rooms to be warmed, to just below the floor of the apartment. There it opens into a box, the depth of the space between the floor joists, and set in soap stone in the floor. The top consists of a metal ornamental grating, below which are flaps working on centres, and moved by a rack and wheel so as to perfectly close or open gradually the apertures for transmission of the heated air into the room. Considerable care and judgment are required in conducting the tin pipes to the several levels, and in carrying them in horizontal directions. Workmen generally contrive to have them as nearly as possible in the centre of the house, and the pipes perpendicular; although there is no difficulty in leading them nearly in a horizontal direction, provided this is done at first on leaving the air chamber, and then continuing them up to the required point of discharge. It will no doubt suggest itself that the longest pipe will draw off the heated air from the chamber with greatest rapidity, and aware of this, the mechanics construct these of smaller diameter, but with all their care, it requires a little nicety in the management of the valves in the registers to secure its fair share of heat to each room. In practice, however, it is very rare that all the registers are required to be opened at one time, and my own experience of domestic life in America reminds me that we rarely had any difficulty on this score, and that the furnace once lighted in the beginning of the winter generally remained without going out until April. Servants soon get into the way of managing a machine that saves so much trouble—no coals to carry up, no fire-places to sweep up and keep tidy: all the furnace asks is a good raking out and removal of the ashes in the morning, a few shovels-full of coals about twice a-day and banking up with cinders, and partial closing of the damper at night to ensure a constant fire and a regular heat. The coal used for these hot air furnaces is anthracite, but I know that they can be made, and have been, to burn bituminous coal, such as our own fuel, and that the accumulation of soot in the flues is no difficulty. Should our own manufacturers be inclined to try the introduction of this system of circulating artificial heat through a building, the principal points to secure must be a large heating surface, an air chamber of ample size, and pipes of such diameter as I have described.

Ventilation may easily be secured by adit flues or pipes from the rooms, in fact the in-draft of warm air will be too sluggish to raise the temperature of the apartment, unless means have been provided for its outflow, and this necessity compels an efficient ventilation.

Heating by means of circulating pipes filled with hot water or steam does not differ in its treatment in America much from our own modes, but a common practice now prevails of combining the principles of the hot-air furnace and the hot-water boiler. This is done by having the air chamber heated by circulating pipes instead of by furnace flues, and the atmospheric air from without is introduced, warmed, and distributed throughout the building in the same manner. This system, however, has only been found to answer either on a small scale or as an auxiliary, unless great expense has been gone to in providing a very large boiler, which, moreover, requires an undue amount of room in the cellar. The temperature, too, generally proves insufficient for the severity of an American winter, although in the instances that I remember, in which it had been successfully applied, the quality of the warmed air thus generated was very soft and pleasant.

A new mode, I am credibly informed, now obtains very great patronage and favour. I am acquainted with its details, although it was only just commencing to attract attention when I last left New York. It consists of a boiler in the cellar, by which steam is generated and circulated at a low pressure throughout the building. The heating of the air is, however, effected not always or necessarily in a general air chamber common to the whole house, but in special chambers attached to each room. This is done by admitting the steam into a radiator consisting of two thin plates of iron forming a case, stamped by machinery with curved indentations to increase the radiating surface, and of a size corresponding to the dimensions of the apartment to be warmed. One or more of these are used and are enclosed in a case which, in fact, forms the air chamber, communicating with which is a tube carried along the floor joists, and opening into the external air, through which is admitted the current of fresh air to pass over and around the radiators, and thence through apertures into the room. The whole of this apparatus may either be below the floor, with a register at top the same in make to what has been described before, or it may be in the side of the room with an ornamental front. The inventor of this mode of heating suggests it may occupy the opening of the fire-place, and manufactures many highly ornamental gratings for that purpose, but the objection that so doing would cut off a natural and commonly existing mode of ventilation seems to me fatal.

The best apparatus for applying this mode of heating is that known as *Gold's Patent*, as manufactured by the *American Automatic Steam Company*, and perhaps the best practical testimony that can be offered in its favour is the fact that the New York Board of Fire Insurance have agreed that all the Companies of that city will make a deduction of 10 per cent. on all risks where this mode of heating has been adopted.

Professor Silliman—a name, I am sure, well known to all scientific readers—gives very careful and laudatory testimony to the satisfactory results of an introduction of this apparatus into his own residence, and I read the names of many of the leading medical men of the present day as recording their equally favourable opinions.

It is not likely that we in England will ever willingly, or at all events generally, give up our cheerful-looking open fires in favour of any concealed mode of heating, however economical, convenient, or healthful; with us, all such appliances must be only auxiliary, as for instance to warm halls, corridors, and large rooms; nor do I know that in America has the system been so exclusively carried out as to permit but the one smoke flue required by the heating apparatus, and the omission of ordinary fire-place openings and flues to every room. I notice, however, that such an arrangement is strongly advocated there now, and builders are advised that now smoke flues need be built but for the cooking range and heating apparatus, and that all rooms should have instead metal or glazed earthen tubes carried up in the walls for ventilating purposes only. It is an open question whether a building will gain or lose in an architectural point by omission of such well-known features as stacks of smoke shafts above the roof, and meanwhile houses are built as heretofore, each with its own separate chimney opening to every room.

I have now, I believe, described in general terms, the modes adopted in America of heating the interior of private residences, the systems applying equally to town and country; there are many different apparatus in use, but all may be classified under the heads of furnace and hot-water or steam. The business done in the sale and fitting of these machines is enormous, and of course each vendor puffs the particular apparatus he has to sell in extravagant terms; I have, however, selected one of each kind as fairly illustrating the best in use, and will briefly say that any explanation of points of detail I shall be very happy to give to any member who may wish for further explanation, either by letter, or personally. I feel it would be impossible to do justice to this very comprehensive subject without numerous diagrams and models, and must therefore content myself with the brief remarks I have ventured to offer.

I now wish to call attention to plans of country houses made in accordance with a request of a respected and distinguished member of the Council. I have been at a loss to select such as best seemed to illustrate some peculiarities either of arrangement or construction, but have chosen two as very fairly representing the general provision made by architects to supply the features of a country home, and at same time strongly bearing out all the points dwelt upon in the previous paper.

One of these represents a country house standing in grounds of great grandeur and considerable extent upon the banks of the Hudson River, some eighty miles from New York, and which in all its fittings and arrangements is essentially a "Gentleman's House," although not reaching in grandeur and extent the scale of our nobleman's mansion or gentleman's country seat. It is, I assure you, by no means a solitary specimen of a class of house that exists in far greater number than we in

England are generally inclined to suppose, nor is this so extensive or costly as many others I could refer to. It is not claimed as at all approaching the importance of an old family country seat in England, but, as will presently be seen, it is somewhat beyond our country villa. The house stands in an estate laid out in park and lawns and pleasure gardens, on a scale not behind many of our own, and it is not a new place, which is one reason I have selected it as an example for illustration, but is an old manorial residence which was restored and refitted under my own care a few years ago, the original structure requiring considerable repair.

The general plan of the house is a parellelogram, with a projecting porch in front, and a semi-octagonal projection in the rear, the latter carried up above the main roof-line as an octagonal tower.

It is surrounded on all sides by a wide colonnade, the floor being sufficiently raised above the ground level to allow free circulation of air to the area below, which is carried round the building in the same manner, having the spaces between the piers that support the columns above filled with lattice work, and thus screening the domestic offices which are disposed in the floor below.

The entrance is by means of a wide and lofty carriage porch extending beyond the portico, which breaks in upon the veranda in front; within the open portico is an enclosed outer vestibule, containing inner and outer doors which lead into the entrance hall. These doors are so contrived that one pair may be left open in summer time, and the air admitted through perforated iron panels in the pair left closed. The hall itself is of considerable size—28 by 24 feet. In this is the principal staircase, rising by a wide single flight to a landing, and then branching right and left to the floor above. Next to the hall is an inner hall containing private staircase. The principal suite of rooms is upon the rear or river front, and consists of a central octagonal room 26 feet in diameter, used as a library; a drawing room on the right, and a dining room on the left, each of these being 28 by 22.

The other rooms on this floor are a study or gentleman's room, an ante room connecting this with the hall, a large room or pantry for service, and on the other side of the hall an ante room and dressing room, and a boudoir.

The library has in addition to its projecting octagonal sides, a large bay window in the centre opening on to the colonnade, and immediately opposite to this the colonnade is extended on to the lawn in an elongated semicircular form, making a pavilion or ombra, which in this instance is of great value and utility, as the view is magnificent beyond description, whilst the shade of old and noble trees prevents the sun from too warmly penetrating. The ombra roof terminates in a flat dome, is carried upon columns and is furnished with inside Venetian blinds. The finish of the library being somewhat peculiar a brief description may be interesting. The room is lighted by the large projecting window, the apertures shown on the plan in the sloping external sides of the octagon being lunettes of plate glass above the bookcases, and upon the opposite sides are similar bookcases, the lower portion, however, being of marble, so contrived as to form a fire-place for an open wood fire in one, and with a similar design upon the other with an ornamental grating, as a front to the hot air register communicating with the heating apparatus below. The wood work of this room is American black walnut, elaborately carved and moulded.

The dining room is wainscoted from floor to ceiling in rich panels with carved and gilded embellishments, the cornices above the windows being portions of the general design, and the curtains arranged to be hung within them. The mirrors are panelled into the walls, and the ceiling bordered with a band of coloured and gilt decoration, and the centre filled with diaper.

The drawing room is of a lighter cast. The opening of the bay window is carried by pure white marble columns with Ionic capitals, and the wood work is enamelled in light colours, with surfaces polished to the texture of porcelain, and enriched with gilding.

The floor below contains the domestic offices. All around the building is a paved area under the veranda floor, and the walls are extended under the portico and carriage porch. In the centre of this floor, sunk three feet below the general level, is a large space devoted to the heating apparatus, which is left entirely open and unobstructed, so as at all times readily to be got at and attended to. Iron railings surround the sunk area in which it stands, and the sides are built of fire-proof brick. This floor comprises kitchen, servants' hall, laundry, service room with lift to the corresponding room above, servants' bath room, water closets, store rooms, sleeping rooms for men servants, (placed near the safe and plate rooms), and all the appliances for liberal house-keeping. The space underneath the ombra is a billiard room.

The bed room floor contains nine large bed rooms with bath rooms, dressing rooms, &c., and in the roof and octagon are attics and servants' bed rooms.

The out-door servants are accommodated in cottages, two of which are of such size and character as to serve as guest-houses for visitors. The stabling and all necessary out-buildings are in a valley near the house, but secluded from view, and are upon a liberal scale. The plan of the stable is polygonal, with the stalls all arranged round a centre, large enough for the grooms to pass in front of each horse, and in this a spiral staircase leads to the lofts and rooms above. This staircase surrounds a hollow cylindrical shaft, down which the feed descends for distribution from within the inner circle to the head of each stall. The outer circle beyond the rear ends of the stalls is so wide as to form an exercising ring, and beyond this again a roof extends, under which the horses are groomed in the open air. On the floor above are feed lofts, and a large number of single rooms for the men, with a large room for their general use. The carriage houses, saddle, and harness rooms, are detached, forming a wing to the centre building on one side, and on the other is a corresponding projection containing loose boxes and an infirmary.

The point of sight from which the illustration is taken gives the garden or river front, the entrance approach being upon the other side. The situation is unsurpassed for richness and grandeur of scenery, and upon the opposite side of the river are the Catskill Mountains, with the well known Mountain-house plainly in sight.

If space permitted, I should like to give descriptions of many other country residences—far more extensive than this, and which, in their arrangements, the size and disposal of the grounds around them, and the manner in which their owners live, would, I think, satisfy you that the American gentleman's country house is neither so rarely to be met with as may be supposed, nor is it either an enlarged farm-house, nor the occasional residence of a mere man of business. It is true that an entirely unoccupied man is rarely to be met with in the United States—nearly all are engaged in business or professions, or in the busy life of politics, but there are many families who generation after generation live upon their great estates, and hand them down from father to son, the eldest maintaining all the prestige and standing of a country squire, and well responding to the claims of his position. There are many descendants of good cavalier families in the Eastern States as well as in Virginia, and other parts of the South, who retain the estates upon which they originally settled, the revenues of which enable them to maintain themselves in affluence and independence. On the shores of the Hudson are numerous families of Dutch and English descent who yet hold and pride themselves on retaining the lands granted to them by Royal gift, and the confirmation of the original tribes that held sway over them. These in their refinement of living, and in the respect in which they are held by those about them, form a class more nearly resembling our landed gentry than possibly you may be prepared to suppose. In the neighbourhood of Philadelphia are some grand old family mansions, and in many of them a liberal unostentatious hospitality is dispensed, which would do credit to an English squire. Old-fashioned plate is shewn, which has been handed down from one generation to the other, and as deep a reverence is felt for these heirlooms and the old family portraits on the walls, as we could find in any good old family at home.

The next illustration is of a timber cottage of ordinary size, showing in its plan, accommodation for a moderate family. It stands in an estate of some extent, and is the residence of a gentleman of wealth and leisure. The situation is in a wood on one of the range of hills overlooking the rich valleys of the Housatonic, in Berkshire County, State of Massachusetts. The house is built of materials afforded by the estate, the stone for the foundations quarried on the spot, and the timber grown upon the land. It is of frame filled in with place brick between the timbers, and covered externally with two thicknesses of inch and a quarter plank, one placed horizontally, and the outer upright with chamfered battens two and a quarter inches thick pinned over the joints. This is a very common mode of building where timber is abundant, and it makes a quickly built and very warm and durable house. Externally it is painted, and the main body of the building has the last coat sprinkled with fine sand thrown closely on whilst the paint is wet, which hardens and becomes a water-proof and lasting covering. The roof is of oak shingles.

The ground floor is thus arranged. The entrance door leads into a vestibule, on each side of which are hall closets, externally lighted by narrow windows, and with glazed doors into the hall. The inner hall is 10 feet in width and contains the principal staircase. Upon the left side of the hall are a drawing room in front with bay window and a library. These rooms are of moderate size, each, exclusive of the bay, being 23 feet by 16, and they are surrounded by a wide veranda extending the whole depth of the house, and returning across the rear. Upon the other side of the hall is the dining room with a veranda in front, and a projecting bay at the side. This room is 16 feet by 24, exclusive of a recess at the end for sideboard. Communicating with the dining room is a large service room, a door at end of which opens directly into the kitchen. In this room is a small copper sink for washing china and glass.

At the end of the entrance hall is an inner hall, containing the secondary staircase. In this is a closet for fishing rods, baskets, &c., and connected with it is a dressing room with water closet and washstand, and an outer doorway leading on to the veranda, and forming a garden entrance.

Beyond this are the domestic offices, consisting of kitchen, store closet, larder, wood house, laundry, servants' and garden water closets, and a side veranda sheltering the outer doorway to the kitchen.

The height of the principal rooms and hall of this story is 11 feet, and the domestic offices 9 feet 6 inches.

Above this are eight good chambers, a large and cheerful hall, with an alcove, leading to a balcony over the front door, a bath room and a water closet, linen closet, dressing closets, and housemaid's closet and sink.

Below the ground floor is a cellar under the whole building, with a furnace in the middle of the front portion, and milk rooms, ice house, vegetable and other dry store rooms in the rear wing.

A peculiarity of the exterior is that all the window openings are furnished with Venetian blinds, which are made to slide sideways into the wall.

The cost of this building, including blasting out solid rock to form the cellar, furnace, plumbing and painting, was twelve hundred pounds; it was built about ten years ago. One of similar extent and finish was erected at the same time in a different situation for about a thousand pounds. The site of the cottage under description caused expensive works, and access was difficult.

Permit me, in conclusion, to say that these drawings of two American country buildings are not offered on account of any special merit in design—but as fairly elucidating my remarks; convenience caused me to select them on account of having the means of offering the illustrations at hand, and you must kindly view them as fair examples of the style of house that may commonly be found, and not as studies for criticism.

Professor **Kerr**, Fellow, was sorry that the remarks made by him upon a former occasion should have apparently led Mr. Wheeler a good deal out of the way with respect to explanation. His purpose had gone no further than this:—to state his belief that although there might be, and must be, of course, many good houses scattered over the country in America, yet at the same time scarcely any of those houses could be said to rise to the rank of what is called a first-class country house in England, and he must be of the same opinion still. For example—the plan which Mr. Wheeler has laid before the Meeting, would rise no higher than the rank of a common suburban house in London, Liverpool, or Manchester, or any other large town; those houses which are scattered over various parts of this country, as seats of the aristocracy and gentry, being altogether of a different class in a multitude of essential particulars.

The manner in which Mr. Wheeler had disposed of the domestic offices, seemed quite to bear out this view, for it was well known that in any first-class residence in England, the offices were in one sense the most difficult part of the composition; the servants being, so to speak, much more difficult to please than their masters; in other words the architect can often design a *suite* of family rooms with facility, where he would fail to produce those arrangements in the domestic offices which will produce peace and contentment in the household.

The remarks which Mr. Wheeler had made with respect to the aristocracy of America, did not seem to require any contradiction or even explanation, but the practical description which he had given of the heating and ventilating system in America, seemed to deserve consideration.

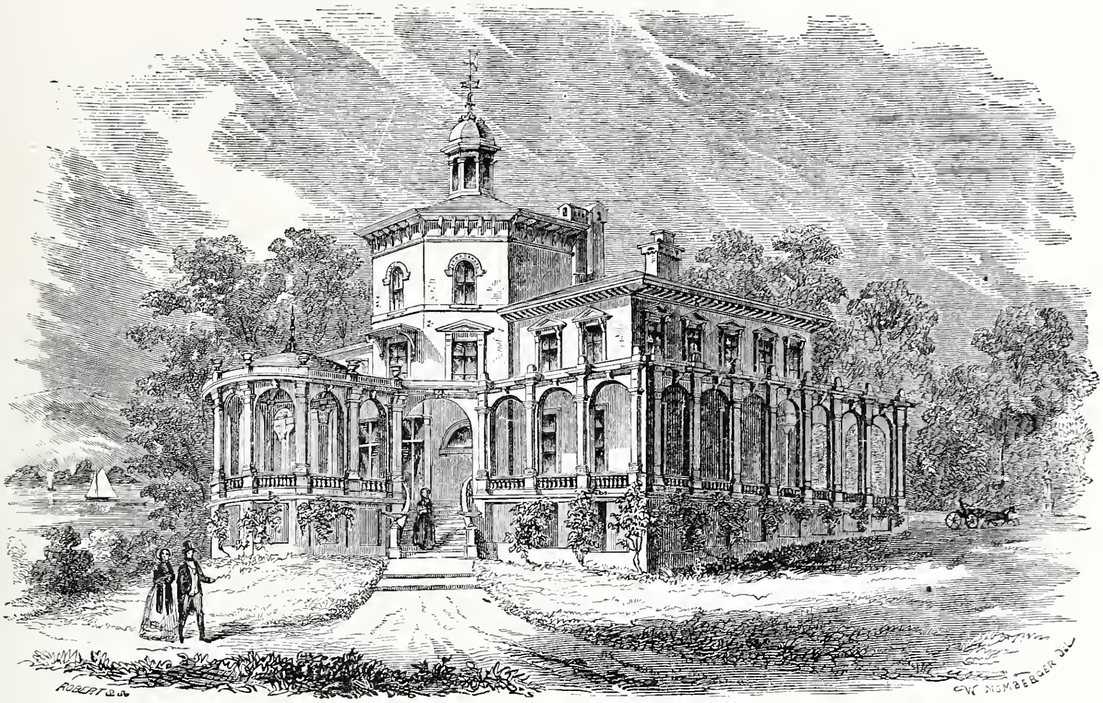
The felicity of rough-and-ready contrivance possessed by the Americans was marvellous, and very possibly something well worth our study might be discovered in their system of heating a house. At the same time he himself was much disposed to adhere to the system of open fireplaces, and when necessary, open windows, as being for this climate the most natural of all.

In answer to questions, Mr. **Wheeler** remarked that the basement plan of the larger country house represents ample domestic accommodation, servants not being no numerous in America as with us; in addition to which detached buildings in various parts of the grounds afford rooms for the men and out-door servants. In regard to the great depth of the ground floor, of the example of the town house, he said that he had always found sufficient day-light in the ordinary reception rooms of New York houses such as the one shown by the plans (the light coming in at windows in the end walls some 50 to 60 feet apart), as the atmospheric light was greater than in London, and the streets wider, and the sliding doors in the long room were always open. The staircase was lighted by a skylight, and the houses were separated by party walls, the bricks measuring eight inches in length.

Mr. **Seddon**: I beg to propose a vote of thanks to Mr. Wheeler, for his very interesting paper. We all read his former paper with very great profit, and the present additional remarks supply a number of interesting details of considerable practical value.

The **Chairman** said, our thanks are due to Mr. Wheeler, who has certainly given us a great deal of information both at the past and present Meeting; I am therefore sure you will accord your best thanks to him for his kindness.

The meeting then adjourned.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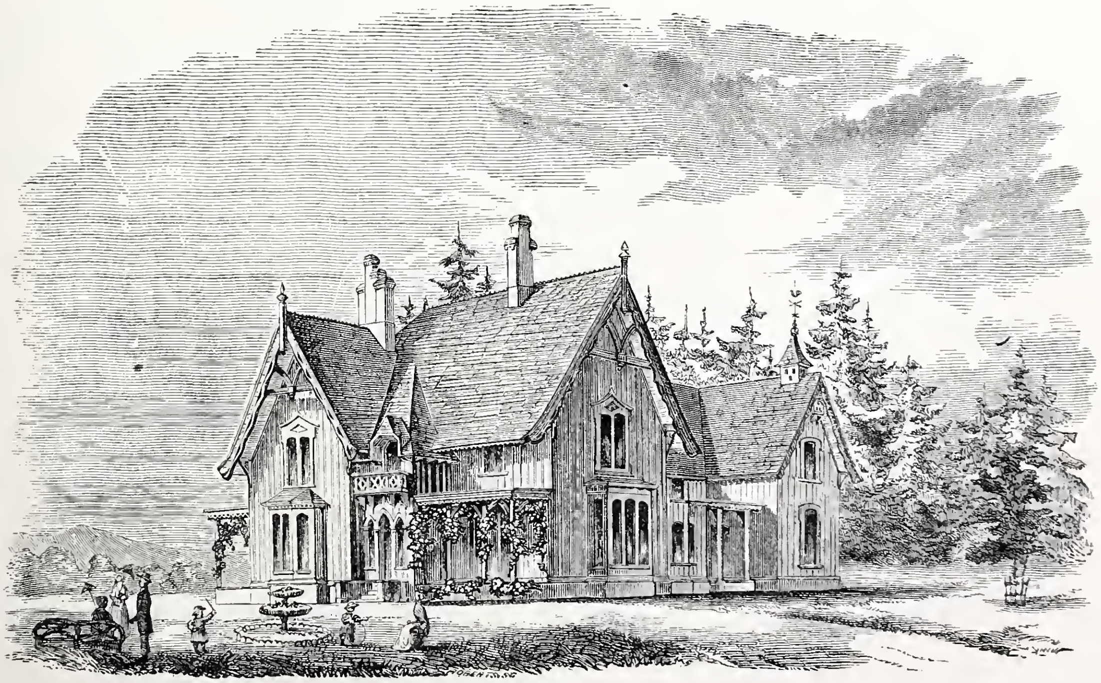
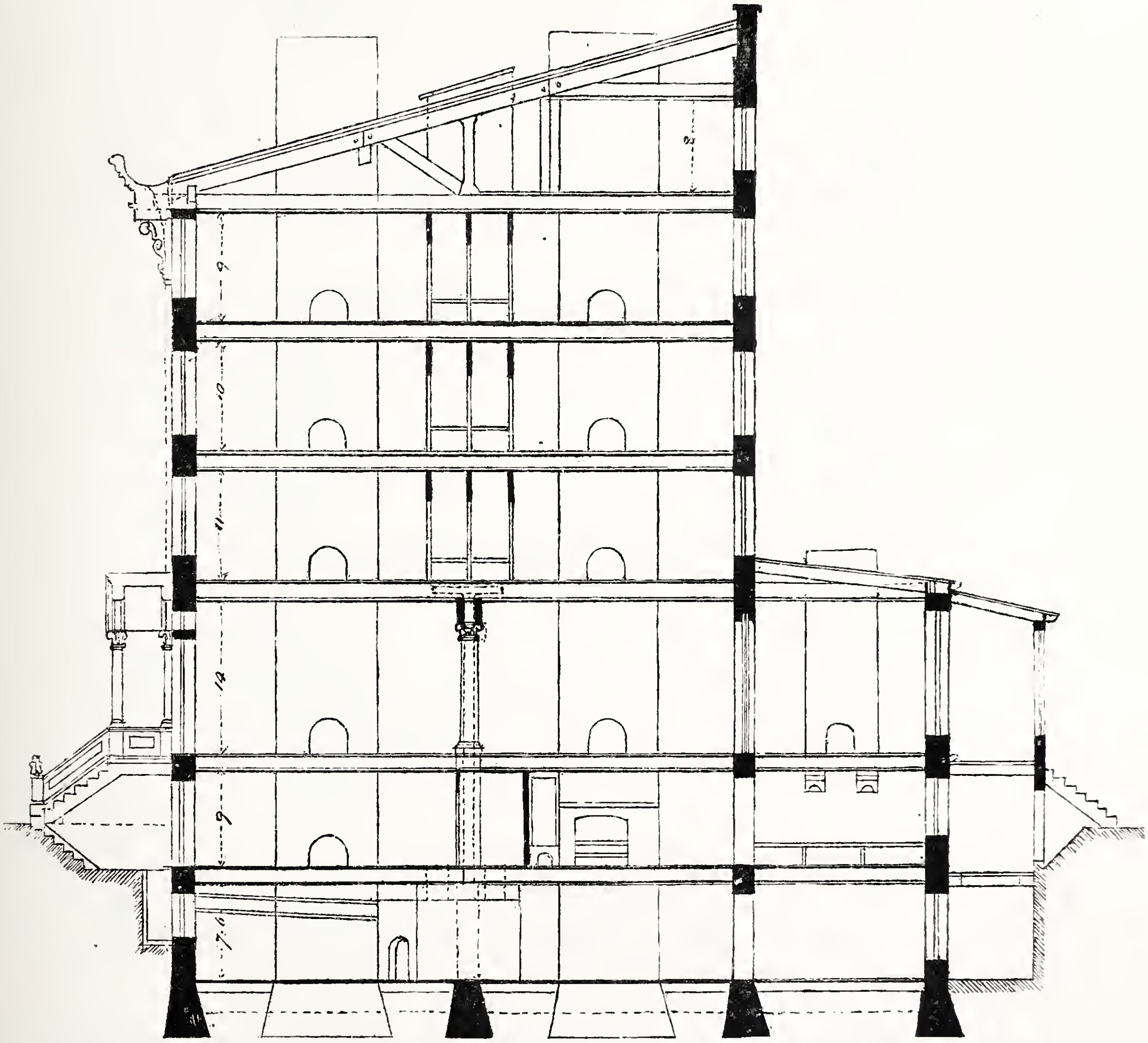
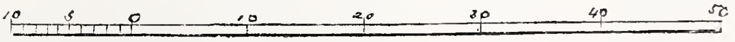
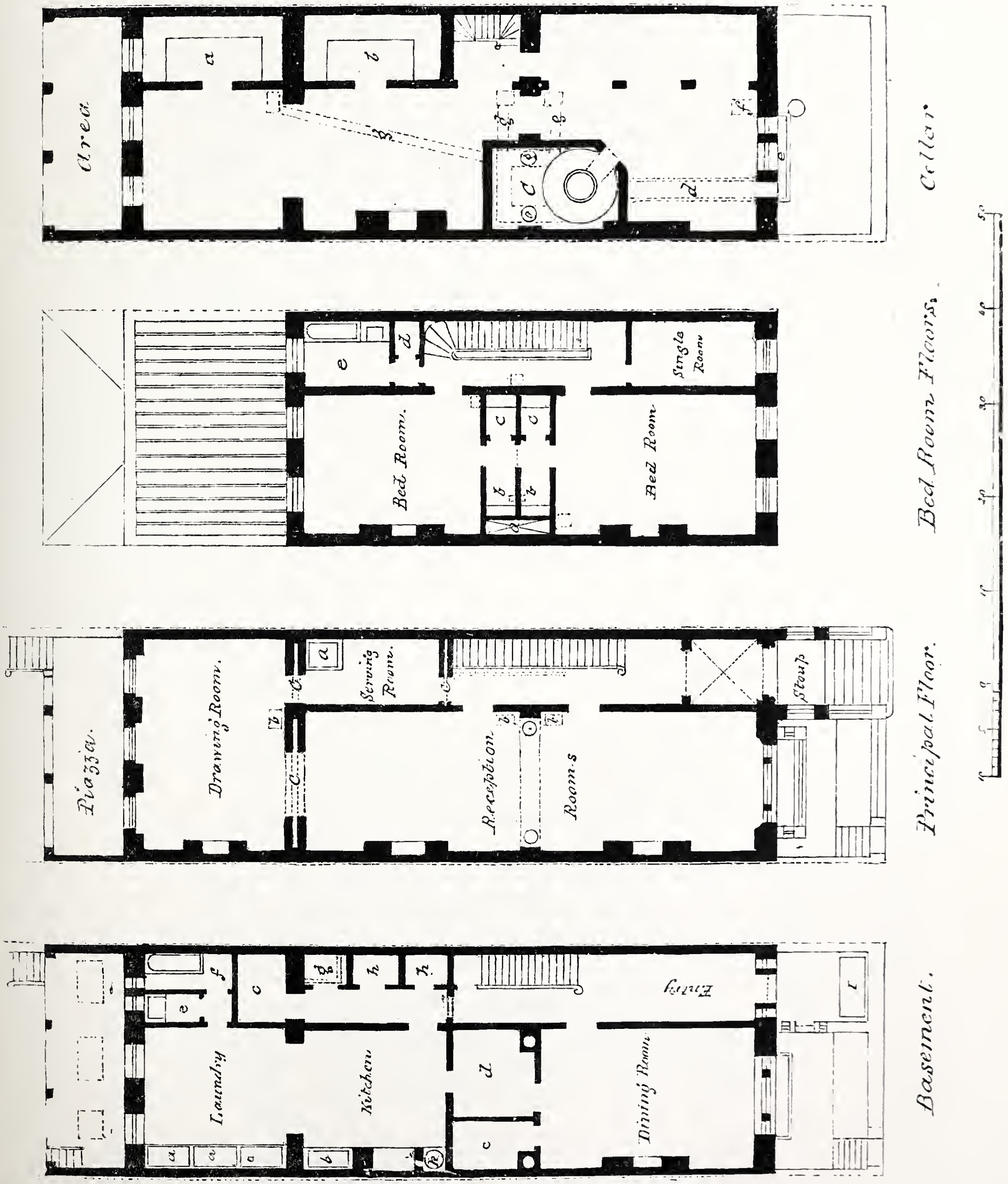




Longitudinal Section

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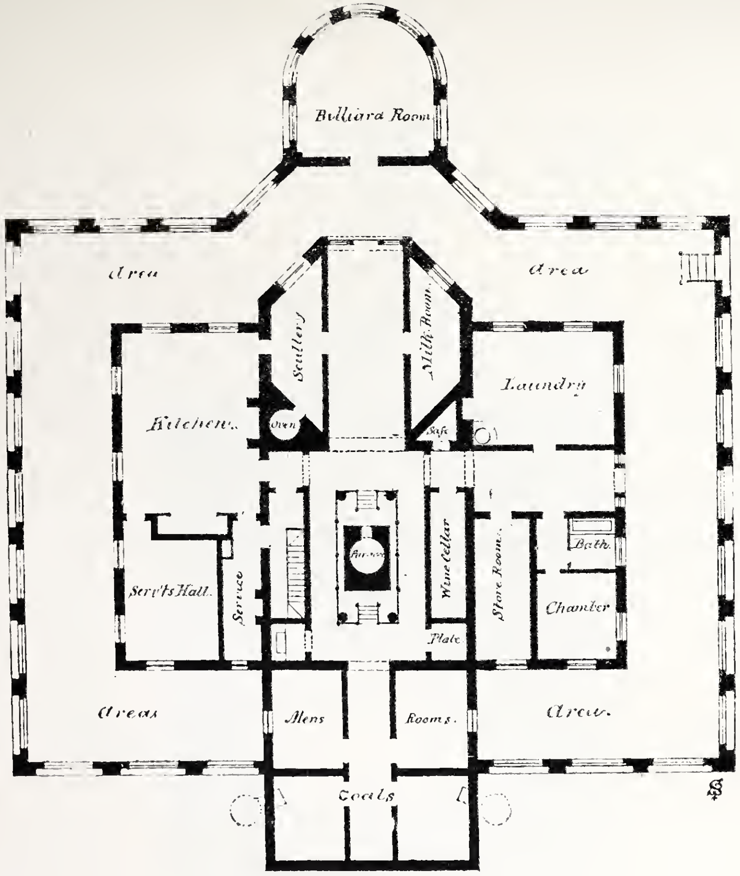
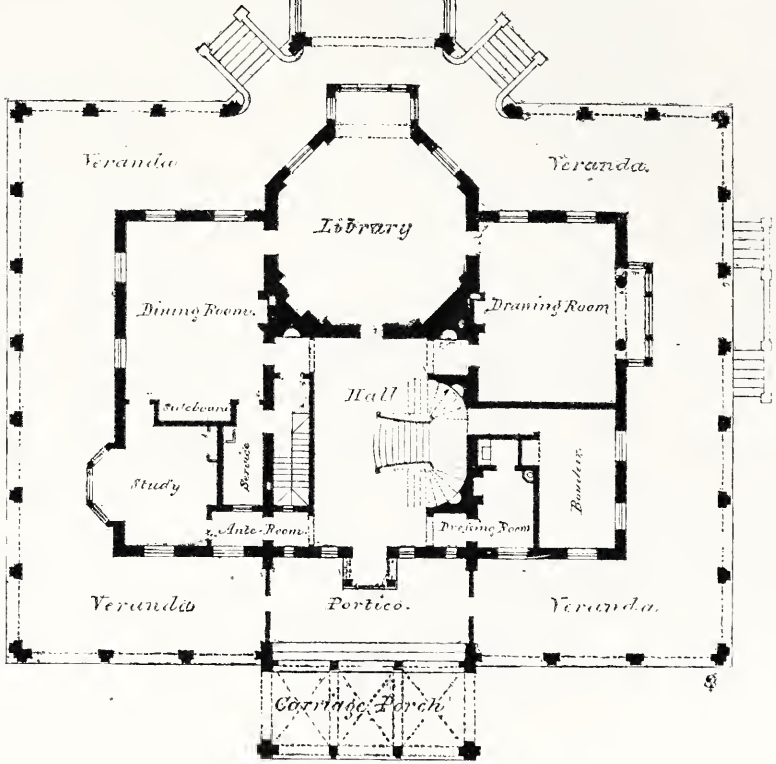
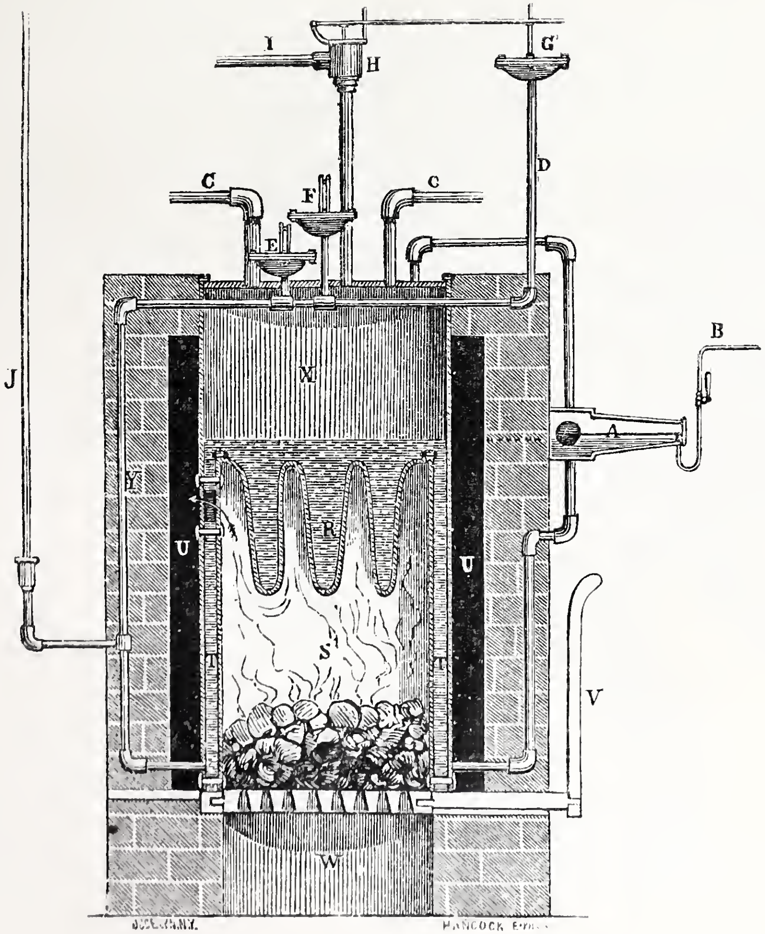
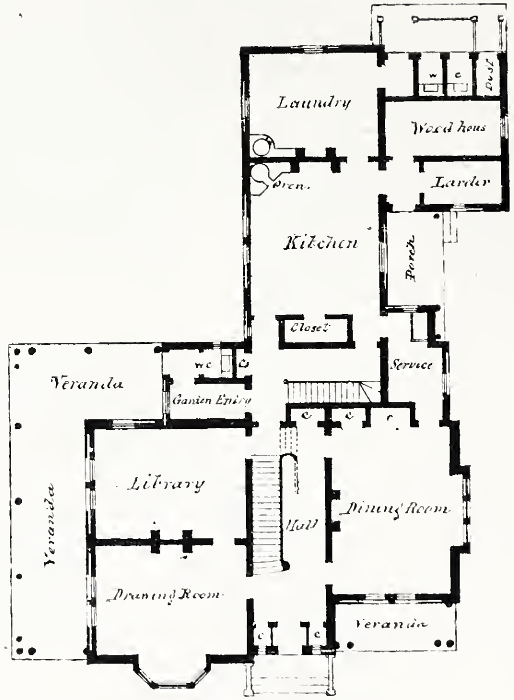


Basement Plan

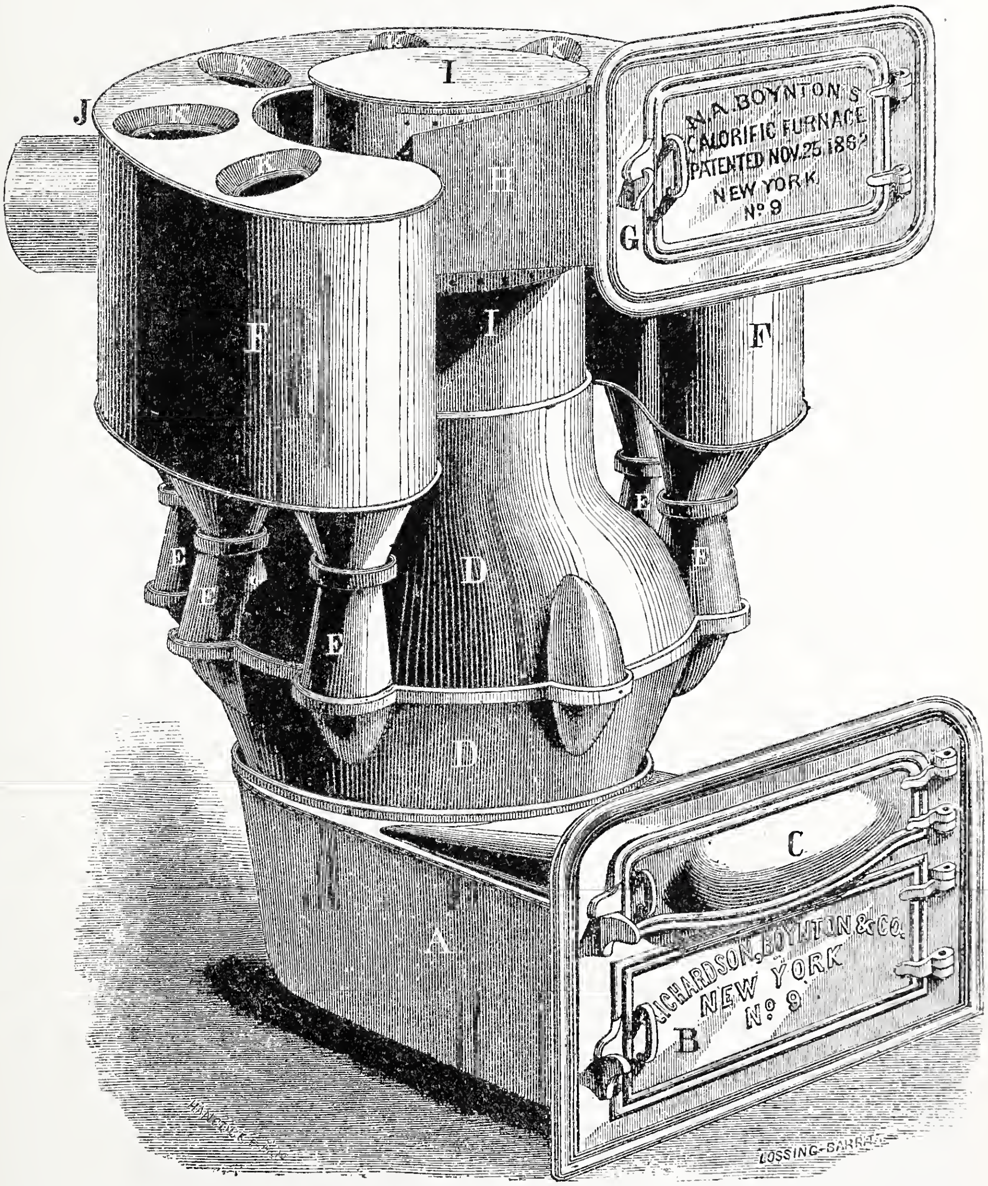


Plan of Principal Floor.





Principal Floor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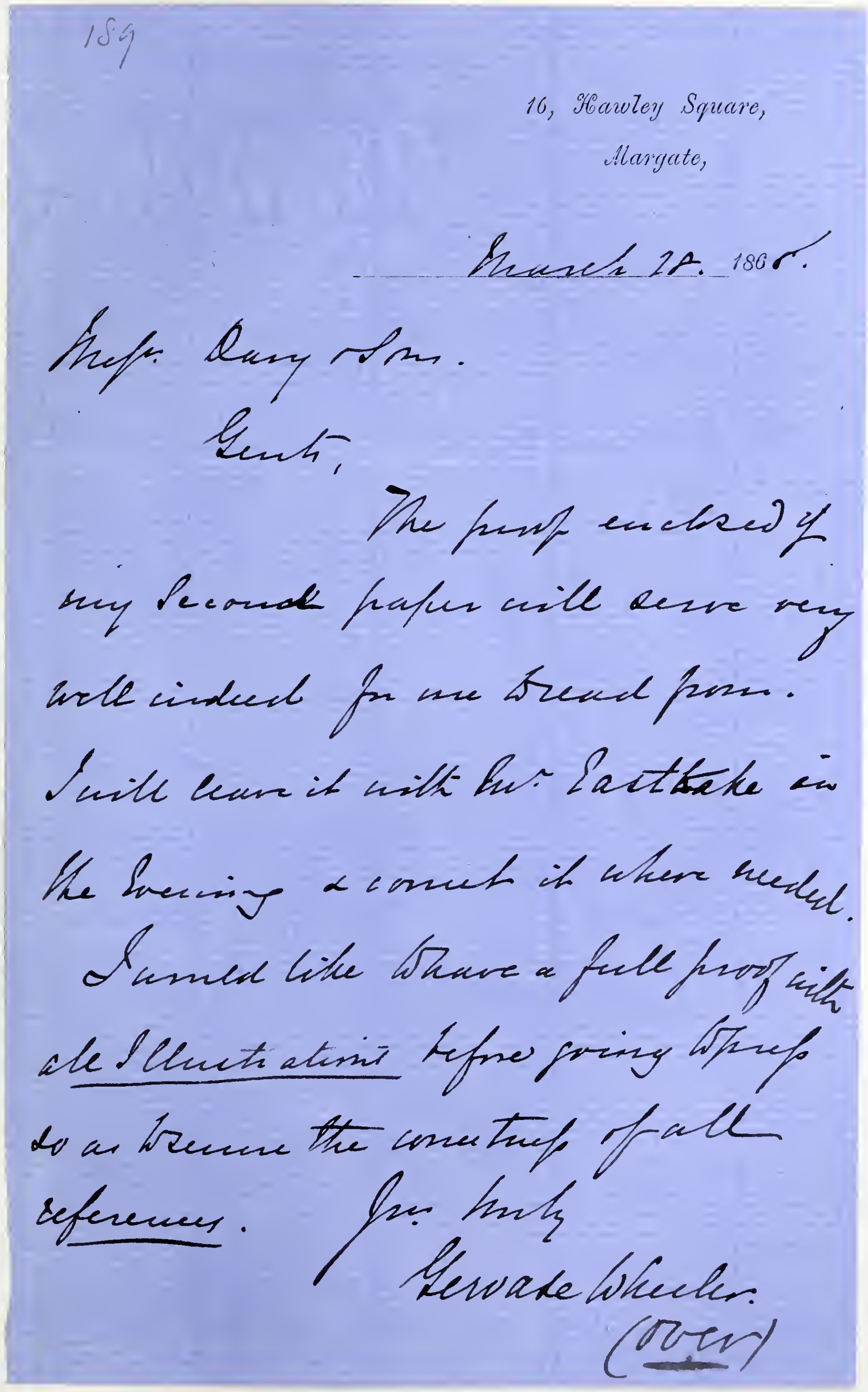


16, Hawley Square,
Margate,

March 28. 1868.

Messrs. Day & Son.

Gents,

The proof enclosed of my Second paper will serve very well indeed for use Second proof. I will leave it with Mr. Eastlake in the evening & correct it where needed.

I would like to have a full proof with *all Illustrations* before going to press so as to ensure the correctness of all *references*.

Yrs truly
Gervase Wheeler.

(over)

DOMESTIC ARCHITECTURE IN AMERICA.

REFERENCE TO ILLUSTRATIONS.

Page 177.—VILLA on the Hudson, New York, U.S. GERVASE WHEELER, Architect.

,, TIMBER COTTAGE, Great Barrington, Mass. U.S. GERVASE WHEELER, Architect.

Page 179.—Section of a New York Ordinary TOWN HOUSE.

Page 181.—Plans of a New York TOWN HOUSE.

BASEMENT PLAN. — A. A. A. Washing Troughs. B. Sink. C. C. China Closets. D. Serving Room. E. Water Closet. F. Servants' Bath Room. G. Lift. H. H. Store Closets. I. Ice Chest. K. Boiler.

PRINCIPAL FLOOR.—A. Lift. B. B. B. Hot Air Registers. C. C. Sliding Doors.

BED ROOM FLOORS.—A. Light and Air Shaft. B. B. Dressing Closet with Wash Stand and Bath. C. C. Dressing Closet with Wardrobe. D. Cedar Linen Closet. E. Bath Room and Water Closet.

CELLAR.—A. Larder. B. Wine Bin. C. Heating Apparatus. D. Cold Air Box. E. Area. F. Coal Shoot. G. G. G. G. Hot Air Ducts.

Page 183.—Plans of VILLA on the Hudson (*see* page 177).

Page 185. STEAM GENERATOR.

A. Water Regulator. B. Service Pipe. C. C. Steam Pipes. D. Hydrostatic Column, preventing explosion or collapse. E. F. G. Lever attachments, to prevent accumulation of steam and increase of pressure. H. Escape Valve. I. Waste Pipe. J. Glass Tube showing steam pressure. L. Feed Door. M. Draft Door. N. Draw-off Valve. R. Boiler. S. Furnace. T. Water Jacket. U. Flues. V. Lever to turn grate bars. W. Draft Hole. X. Steam Chest. Y. Water Guage.

,, Plan of TIMBER COTTAGE (*see* page 177).

Page 187. HOT AIR FURNACE.

A. Base. B. Ash Pit. C. Draft Door. D. D. Fire Pot. E. E. E. E. E. Direct Radiating Flues. F. F. Radiator. G. Feed Door. H. Feeder. J. J. Magazine for Coals. J. Smoke Pipe Collar. K. K. K. Inside Radiating Flues.

Royal Institute of British Architects.

At the Special General Meeting (for the Presentation of the Gold Medal, &c.), held on Monday, the 27th April, 1868, W. Tite, M.P., President, afterwards E. B. Lamb, Fellow, in the Chair.

Professor Donaldson, P.P., Hon. Sec. F. C., after presenting to the meeting some fragments of ancient bas-reliefs which had been received from M. Texier, Honorary and Corresponding Member, read the following letter:—

DESCRIPTION OF SOME BAS-RELIEFS FROM GUERDZA, IN N. AFRICA.

By Monsieur Charles Texier, Hon. and Corresponding Member.

Sir,

I have the honour of transmitting to the Royal Institute of British Architects, bas-reliefs, which have been sent to me from the ruins of Guerdza, an ancient town of Berbéres, situated about 250 miles south from the town of Bengazi (Ben-Gazi means, "the son of the conqueror"). Long ago the traders of Central Africa spoke of having met with important ruins on their route. A consular agent was struck by their various accounts of ancient palaces, upon which were sculptures of men and animals hunting, and extraordinary figures. He requested these same men to bring back with them some of these sculptures, which were afterwards forwarded to me at Paris. These I now have the honour of offering to the Institute, as specimens of an art but little known. All this region of Africa up to Morocco was, from the remotest period, inhabited by a population which might be considered as aborigines; for prior to them all is obscure. At the present time they may be traced in Egypt, under the name of Barabras; in Sahara, under the name of Touareg. They speak a language which seems to be the ancient Lybian, and they have peculiar numerals. These people are described by historians as Berbéres, of whom Ibn Khaldoun has written the history. In the mountains in Algeria, to the south of Cherchel, are to be found some vestiges of the art of this people, in coarsely worked bas-reliefs on the rocks, representing the chase in the same style as those at Guerdza.

Although from what is known of their language, this people do not appear to belong to the Semitic race, they seem to ally themselves with the people of Asia in the custom of regarding hunting as a special exercise. The Assyrian bas-reliefs, in which the monarch is represented piercing the lions with arrows, are well known. On the walls of Babylon, according to Ctesias, were represented on painted bricks great Royal Hunts. Indeed, in our own days may be seen, on the rocks of Bisoutoun, Sassanian kings chasing the wild boar in their large parks, called Paradises. The bas-reliefs of Guerdza prove to us, that the same usages existed amongst the inhabitants of this town. One sees the dogs set upon an antelope and pursued by horsemen. Another fragment shows us a man clad in the same manner as the indigenous inhabitants of the Sahara. We are not able to collect more than these imperfect notices of a town, which as yet has never been visited by any European travellers.

I would also mention a fragment, which I have presented to our Paris Æthnographic Society, which represents a camel attached to a plough—a custom altogether abolished in North Africa, and which I have never seen either in the Sahara or any other Southern province.

CHARLES TEXIER.

To Professor Donaldson,
Hon. Sec. Foreign Correspondence.

PRESENTATION OF THE ROYAL MEDAL, &c.

The preliminary business of the evening having been dispatched, the **President** rose and said:—I have now, Gentlemen, to perform one of the most important duties which can devolve upon the President of this Institute; it is the presentation of the greatest honour which we have in our power to bestow. You are well aware that for a considerable number of years Her Most Gracious Majesty the Queen has been pleased to grant, annually, a gold medal to the person whom the Council of the Institute recommend to her gracious consideration. Many of us have had the honour and happiness, in years past, of receiving the medal, and some of us carry on our persons the evidence of that honour in the decorations which we have the pleasure of bearing this evening. On the second occasion of my being President of this Institute, I have the exceeding happiness to find that Her Most Gracious Majesty has again accepted the unanimous recommendation of the Fellows of the Institute, (for this is not done by any mere hole-and-corner meeting, but is submitted to the whole body, and receive their confirmation or otherwise as the case may be); and I have the pleasure of telling him that the nomination of the Council unanimously in the first instance fell upon a very old friend of the Institute, Austen H. Layard, Esq., and Her Most Gracious Majesty, accepting that recommendation, has been graciously pleased to assent to the presentation of the Gold Medal to Mr. Layard as a mark of appreciation of what he has done in the cultivation of archæology and architecture. (Cheers). It is a curious fact, but I believe the very first appearance our excellent friend, Mr. Layard, made in public, on his return from one of his earliest journeys, was at the Institute of Architects. I recollect distinctly—and my memory sometimes helps me to unhappy incidents, but on the present occasion to a very happy one—I recollect distinctly that I had the honour of attending with Mr. Layard, when he was but very little known, and having the pleasure of introducing him for the first time to a meeting of British Architects, not indeed in this room, but in the room where we formerly met in Grosvenor Street. That was in 1848; twenty eventful years have passed over us, but I believe in respect to archæology and architecture there has been no happier recognition of his services than occurred on that evening, nor can it be more than excelled by the recognition he receives this evening. We had received previously from him, through Mr. Mare, some letters which he had written to that gentleman, telling him of his apparently unassisted services, and these were read when the names of the places he spoke of were with difficulty recognized, and I have often wondered how he could possibly make his way against the enormous difficulties he had to contend with, and produce the results which we see exhibited in our museums. We desire to recognize the obligations which we, as Englishmen, owe him, for I think if any man go to the British Museum, after having visited, as we have all done, the Museum in Paris, he will see that our obligation is as great, if not greater, to Mr. Layard than to the eminent Frenchman who assisted him. He really fought the battle almost alone; he had to bring his own fortune to bear upon the matter, and it was a doubtful question at the time whether the Government of England would recognize his services, or cared a farthing about any bulls, except, perhaps, Irish ones. (A laugh). But for his extraordinary energy, and the money which he himself spent, and but for the efforts which his genius, and talent, and energy brought to bear, we should not have had the pleasure of seeing those wonderful remains in the Museum at London, and which refer to a time which is so dimly noticed in the records of the Old Testament that even the name of Sennacherib was only made out by Dr. Hinchy with difficulty, and many of the discoveries relate to a period so early in the history of the world that many doubted whether their existence was a reality or not. When you look at Nimroud, at its wonderful architectural monuments (which has been shown so well by M. Fergusson in the Crystal Palace, (and which I hope will rise from its ruins with renewed elegance and grace), and when you recollect the architectural as well as the archæological importance of the discoveries of Mr. Layard, you will, no doubt, agree with me that we did rightly in unanimously recommending him to Her Most Gracious Majesty for this extraordinary mark of confidence. The contributions which our friend has made in this way (referring to some books on the table) are equally remarkable, and indeed almost equally astonishing ; this book before me dates almost from the period to which I have recalled your attention (1848), when this work is published by almost the unaided efforts of an English gentleman, and scholar and archæologist, containing an excellent account of the remarkable discoveries which had been made. Mr. Layard has received a certain amount of the recognition we are happy to acknowledge; the University of Oxford, at a comparatively early period (in 1848 or 1849), bestowed upon him the degree of D.C.L. I must not address him as Dr. Layard to night; it is an honour, no doubt, which he is proud to recognize, but as he has occupied more important positions, we may as well leave that with the reference I have given to it; however, if he wishes to have the honour of being called Dr. Layard, I shall be happy so to address him. In 1856, in recognition of his very eminent services, he was made Lord Rector of the University of Aberdeen, and that is a more recent connection which must give him the greatest possible pleasure. This is not the place, and I am not the man, to refer to his political position; it is thoroughly understood and recognized, and (whatever may be our differences in politics), it is thoroughly appreciated. His intelligence and activity—activity particularly—in the extremely hard work and well-known arduous duty of Under-Secretary, has been remarked, and recognized, and thoroughly understood, not only in the House of Commons, but out of it; for all these reasons, gentlemen, I am exceedingly delighted to be the organ to night, in a very feeble way, of communicating to Mr. Layard our confidence in him, and our thanks for all he has done in these remarkable recondite researches. I have, therefore, Sir, the greatest possible pleasure, by the gracious permission and command of Her Majesty, in presenting to you the highest distinction we can possibly confer—the Gold Medal of the Royal Institute of British Architects.

Mr. A. H. LAYARD, who, on rising, was received with loud and prolonged cheering, said—Sir, it is with no ordinary feelings of gratitude and pride that I receive at your hands this gold medal, which the Queen has been graciously pleased to confer upon me, in accordance with the recommendation of the Council and Fellows of the Royal Institute of British Architects. I may say, Sir, that no one could have felt more surprise than myself when my much esteemed friend, Professor Donaldson, informed me that it was the intention of the Council and Fellows of the Institute to recommend me to Her Majesty for this high distinction. It is no small honour to have one's name associated with those of men who, in by-gone years, have merited and have obtained from the Royal Institute of British Architects the highest distinction which it is in their power to confer. I confess I feel, and feel somewhat painfully, that I am but little entitled to this honour. They have adorned and for the most part contributed to the advancement of the art of which they were professors, or have raised monuments of which their country may be justly proud, and with which their names will be imperishably connected. I need scarcely mention amongst those who are gone and those who are, happily, still with us, the names of Cockerell, of Barry, of Scott, of Hardwick, of Donaldson, and your own, Sir, amongst British architects (most of whom I have had the happiness to count amongst my personal friends and acquaintances); and of those of

Canina, von Klenze, Viollet-le-Duc, and Texier amongst the distinguished foreign members of the Institute. The only claim I could have to this honour—and that claim is indeed but a small one—is that I have succeeded in the partial recovery of an ancient and important branch of architecture, from which many of our most beautiful forms have been derived, and to which some of the noblest conceptions of classic, mediæval, and modern times may trace their origin. I did my best conscientiously as an amateur without professional training (I may almost say without that elementary knowledge which was absolutely necessary to such an undertaking), in describing and illustrating, to the utmost of my ability, the discoveries which I had been fortunate enough to make. If I may venture to trace the considerations which have induced the Institute of British Architects to confer this honour upon me, I might attribute them to a certain extent to that desire, which is especially characteristic of our age, to go to the origin of things, and to submit every branch of art, as well as of science, to the minutest analytical investigation. If I be correct in this view, the discoveries during the excavations at Nineveh, of the remains of Assyrian architecture, may be of some importance in affording data for such investigations, because in them we find the original types—or, if not the original, the most ancient types with which we are acquainted—of some of the most beautiful details and ornaments of the most elegant and refined order produced by the Greeks, namely, the Ionic. It is highly interesting to trace this human progress. Every day's experience and all modern discoveries tend to show that no art nor science came to man at once as a new creation or revelation, but that all things have been brought to the state of perfection which they may have attained by a gradual process of development and by patient and intelligent labour. These discoveries probably owe their interest chiefly to the fact that they show us one of the phases of this process of the human mind, and afford us a valuable and instructive insight into the history of man, of his civilization, and of the development of his intellectual faculties. But, Sir, in considering the nature of these discoveries, I would not wish to attribute to them too much importance. I am afraid that you may have done so ("No, no!"); but this I may venture to say (and I do say it with an earnest belief that it is true), that whatever may be the result of my labours, I devoted myself to them conscientiously and assiduously. From my earliest youth I had felt a deep interest in and a love for art, and it was my wish to be as useful as possible in promoting its knowledge and influence. As regards my connexion with the profession (of which I may consider myself almost a member, as I have long been an honorary member of the Institute, and am now one of your medallists), I look upon that connexion with very great pride, for I believe that in no other part of the world does that profession contain a larger number of highly-educated, able, conscientious, and honourable men than in this country. I do not think that architecture is sufficiently appreciated or understood in England; I do not think that the English public have yet realized the fact that it is the noblest of the arts, and bears upon it most vividly and eminently the impress of the civilization, greatness, and culture of a country. In the very best times of the ancient world (and, indeed, of the modern world), in ancient Greece and Rome, and in Italy, architecture did hold its proper position. It was then recognised that all the other arts were subordinate to it, and that it was in completing and perfecting the work of the architect that the genius of the sculptor and painter was brought into play, and received its greatest impulse. I believe that until that fundamental principle is recognised in this country, architecture will not assume its proper position. If I can do anything in the direction of endeavouring, to the best of my humble ability, to inculcate this truth, and in making these principles better known, I shall feel that I may have some more valid claim than I now have to the high honour you have conferred upon me. Allow me, Sir, to thank you personally for the kind and flattering manner in which you have alluded to me, and have expressed the feelings of the Institute with regard to my services to art. I may, perhaps, venture to correct one statement which you have made, not, I hope, from any feeling of vanity on my part, but for the sake of truth. You let fall an expression which is not strictly accurate: you said that I was aided and assisted in my labours by a distinguished Frenchman. That was not the case. I received no assistance or aid from M. Botta, the gentleman to whom you no doubt alluded. So far from such being the case, he and I were not at Nineveh together engaged in excavations. I preceded him in visiting the ruins, and his discoveries were independent of my own. In 1842 I was for the second time at Mosul, when M. Botta was sent there as French Consul, and it was partly owing to the information and encouragement which he received from me that he was induced to open the mound of Kouyunjik, and afterwards that of Khorsabad, which led to those important discoveries which he has so well described and illustrated in his magnificent work. I do not say this to detract from the merits of M. Botta; on the contrary, I have always said that to him is to be attributed the merit of the first Assyrian discovery; and no man is more worthy of the distinction and of the honour which he may derive from it, both on account of the readiness which he showed in giving every information to me, his fellow-labourer, and the modesty with which he has described his own discoveries. I have been accused of Philo-Turkish proclivities (a laugh); but you will perhaps not think the worse of me if I venture to bear my testimony, on an occasion like this, to the kindness and generosity displayed by the late Sultan, the Turkish Government, and the natives, with regard to my researches in Assyria. Considering the anti-Turkish feelings which prevail among a large number of persons in this country, and which are sometimes carried, I fear, to a great length, it is right that this tribute to a much-abused people should be borne by me. In no other part of the world could I have received such disinterested assistance, and have been allowed to pursue such labours and researches without interruption or molestation. When you remember that the chief importance attached to those labours and researches in this country—I will not say by the Institute of Architects, but by the public generally—was their value in proving the authenticity and truth of the Christian religion, and consequently disproving that of the Mahommedan religion, you will, I think, admit that it was an extreme instance of liberality on the part of the Sultan to permit and encourage them (cheers). I rejoice, Sir, to see you back amongst us in restored health, and to find that you will again be able to take part in the deliberations of that assembly of which we are both members. It appears to me of no small importance that such should be the case, because in that quarter there are many questions looming in the future connected with architecture; and we shall probably have to discuss, before long, subjects connected with the erection of more than one building of great public importance. If we had in the House of Commons more persons like yourself, Sir, able to represent the various branches of the fine arts, we should not have been betrayed into some slight, if not more than slight, blunders, which do not do much credit to the good sense or taste of the country. I think it of no small importance that in these discussions we should have the advantage of your mature experience, and I wish there were others equally able to aid and guide us by their knowledge and advice (cheers). In conclusion, allow me to thank you individually, the Council and Fellows of the Institute, and all its members, for the high honour you have conferred upon me, and to assure you that this medal will be prized by me as one of the most valuable testimonies I possess of the kind appreciation, by a most enlightened part of the public, of my labours (cheers).

Mr. Beresford Hope, M.P.: Before we pass to the consideration of the question which will next occupy the Institute, perhaps you will allow me to address a few words, not only of congratulation to Mr. Layard, but also to the Institute, on this happy and triumphant evening. When I had the honour last session of filling the chair which you now so worthily occupy, the future regulation of this medal came under our serious consideration. We deliberated in the council-room, and we deliberated here: there were many minds, and many views, and many amicable discussions and fightings; but the result to which we came was, that this great Institute should deal with the whole question in a broad and public, and not merely a professional, view. I say "we," because we are all members of this same Institute, as it were, from the first; we had already broken through national jealousies, by deciding that one year in three the medallist should be a foreigner; and we determined still more to break through the barriers, by deciding that he who merited well of architecture, should be he who had become illustrious, not merely by raising buildings for the admiration of time to come, but also for unveiling the secrets of old time and leading us back to the teaching of other days. Last year I had the honour of giving the medal to M. Texier; to-day I am proud to be a witness of the presentation so admirably made by you to Mr. Layard. In M. Texier and Mr. Layard I think we may see the complete symbol of literary men who have devoted their years to the teaching of their fellow-men in their great, common pursuit of architecture. You referred to the degree of D.C.L. given to Mr. Layard twenty years ago: the first time I had the honour of seeing Mr. Layard was on that occasion, when he and I wore red gowns together, and were made Doctors by the University of Oxford. There is one additional claim, almost sufficient in itself to entitle him to this medal, which no doubt you overlooked in our friend. As you truly said, Mr. Layard's contributions to architecture might, if we only look at what he did in the East, be regarded as rather of the archæological class; he made us acquainted with ancient schools of architecture we knew nothing of before. But what did he do for the development of pictorial art in connection with the queen-art of architecture, and as applied to the decoration on a large scale and in developed forms, to the decoration of our buildings—a study plainly cognate with our pursuits? Why, he has been one of the practical founders and main supporters by pencil, voice, and pen, of the Arundel Society. I venture, accordingly, to say that Mr. Layard merits the medal *ex abundanti;* and that his cumulative claim to this honour is more than incontestible. With these feelings, having been concerned in the administrative action, which has indirectly led to this great evening, I could not do justice to myself or to the Institute without giving expression to what I have now ventured to say (cheers).

The PRESIDENT then proceeded with the other presentations; the first being to Mr. W. George Vialls.

The PRESIDENT said: Our excellent friend Mr. Layard, who is honoured somewhat towards the middle of life with a recognition of his services, is delighted to find that we are enabled, by the kind consideration of those who have gone before, to encourage the young. Amongst others, Sir John Soane, an eminent architect in his day, and whom I had the happiness of just knowing, left, to be given annually, a Soane medallion, which I have the gratification to night of presenting to Mr. W. George Vialls (whom I have the pleasure of seeing before me), for the best design in competition for a town-hall. The drawings have been thoroughly well executed, and I believe that you receive this medal with the entire approbation of the Institute, and all those who have carefully examined your work. I have great gratification in presenting you with the Soane Medallion, and I hope you may long live to do credit to the medal; there is also an *honorarium* of £50. attached to this prize, subject to the consideration of the Institute.

The next prize was awarded to Mr. Henry L. Florence:—

The PRESIDENT: As far as my own course in life is concerned, my success is mainly due to having studied Gothic architecture when but little known; but I desire you not to forget, as my friend has said, the merits of classical architecture, and I have done my best, therefore, to encourage the study of both styles. For several years I have offered unsuccessfully a prize for a classic design, but I have the pleasure to find that the Council have recognized the merits of this gentleman, Mr. Henry L. Florence, another competitor for the Soane Medallion, whose drawings nearly approached those of Mr. Vialls in excellence: they consider that he has produced a very creditable design, and very beautiful drawings, and they recommend that out of the amount of my own prize he should receive twenty guineas. I am sure you will approve that suggestion, and confirm our opinion of Mr. Florence's design, in a style of architecture which is not in such favour as it was fifty years ago. I am delighted to find that young men can give time and attention to the study of this style of architecture, and I am very happy indeed to present Mr. Florence with this prize.

The President having then presented a Medal of Merit, awarded in the same competition, viz., for the Soane Medallion, to Mr. Herbert M. Marshall, proceeded to present the late Sir F. Scott's prize to Mr. Ernest Lee.

The President: There is rather a curious incident about this. Some years ago, when a struggle raged rather warm and high about styles of architecture, and I was patronizing Italian, Sir Francis Scott, a learned and excellent person, thought as I was giving a prize for Classical Architecture, he would give one too, for Gothic Design. He is lost to the world, to the regret of those who knew him. I am sorry we differed; I do not think we should if we had come together. I have much pleasure, Mr. Lee, in giving you the Scott prize of Ten Guineas, and I hope you will go on and prosper. I am glad to see a young man like you receive so excellent a reward.

To Mr. Edmund B. Ferrey, who had gained the Institute Medal for drawings illustrating the restoration of Old St. Paul's, the President said: You are the son of a very old friend of mine. I have the pleasure of telling you the Council highly appreciate—and I will for a moment call the attention of the meeting to—your admirable drawings. They are the result of two years' labour. The subject originally proposed was the Restoration of the wonderful Choir of Old St. Paul's. You will recollect that the spire was burnt at the time of the Great Fire. Inigo Jones had been called in and he conceived the idea—which I am glad to say was not fully realized—of Italianizing the building. He put the finest portico England ever saw in front of the cathedral; he re-modelled all the windows, and spent a great deal of money, and would have spent more, but after all it would have been a monument of bad taste. It has been considered a subject worth referring to. Dugdale gives much information on the subject; it was proposed as a subject by the Council, and Mr. Ferrey has produced these extraordinary drawings. If Old St. Paul's had to be restored, we could not employ a more worthy architect; but as that is not possible he must be content to receive this acknowledgment of his skill, and go on and build another St. Paul's somewhere else. I have great pleasure in presenting you, Mr. Ferrey, with a Silver Medal and Five Guineas.

The President next presented a Medal of Merit, which had been awarded in the same competition, to Mr. H. Renault Mangin; the Institute Silver Medal with Five Guineas, to Mr. William Henman (for his drawings of the Church of St. Thomas, Winchelsea); a Medal of Merit to Mr. Charles H. Heathcote (for his drawings of St. Mary's Church, Portbury); and the Institute Medal to Mr. W. Scott Champion (for his essay on the Origin and Progress of Window Tracery): and having respectively complimented those gentlemen on their success, brought to a conclusion this part of the evening's proceedings.

The following Paper was then read:—

ON BUILDINGS FOR EUROPEAN OCCUPATION IN TROPICAL CLIMATES, ESPECIALLY INDIA.

By T. Roger Smith, Fellow.

There exists nothing of a physical nature which causes such an entire revolution in our feelings and habits, in ourselves and in our surroundings, as the addition or withdrawal of a few degrees of heat. Even within the limits of our own temperate climate, we know no contrast so strong as that between a sweltering harvest heat, and the cold of a keen black frost—the sunny life of a brilliant summer day, or the bound-up torpor of a deep winter snow-storm; and when we carry our inquiries to the climates which lie at the extreme limits of human endurance either of heat or cold, we find almost every condition of life reversed. The food, the dress, the dwellings, and the habits of the Esquimaux, have hardly a single thing in common with those of the Hindoo, and both differ widely from our own.

Many of the countries, where the heat of the sun is far greater than in England—and especially the East Indies—are so connected with us by commerce or colonization, that from time to time English architects are called on to design buildings, to be erected within their limits. Not fewer than eight Fellows of this Institute, and four or five other architects, practising here have been, within my own knowledge, lately called on to prepare designs for proposed buildings in Bombay; two others, Messrs. Owen Jones and Digby Wyatt, have, within the same time, been called to act as advisers, respecting a large proposed building for the same city, the plans of which I had to prepare; and they, in that capacity, rendered me cordial and most invaluable assistance, which I am happy to seize this opportunity of publicly acknowledging. Some five or six English architects also are, or lately were, residing and practising in that one city, facts which shew that buildings for such countries as India, may be fairly considered as not too remote from our own possible practice to be treated here. If then the conditions of life, in a tropical climate, are very far removed from those with which we are here conversant, it cannot but be that many differences will exist between the buildings with which we are familiar, as suiting our climate, and such buildings as will suit the tropics; and it will be our business to-night to consider a few of these differences. First, we shall take into note some of the essential requirements for European life in a tropical climate, such as that of India; afterwards we shall consider a few of the peculiarities which will affect the actual erection of the buildings, and the most obvious of the difficulties to be apprehended. Throughout I must be understood to refer to buildings for the use and occupation of Europeans only; my time is too short, and my information on the point too imperfect and fragmentary, for me to say anything on the interesting, though less important, subject of such buildings as are occasionally put up by Europeans in tropical countries for the use of natives. In each of the two heads of this inquiry, we shall be naturally led, as we go on, to notice such expedients and methods as may be best employed, or as have been actually found efficacious in meeting the needs which we shall discover. My own justification for bringing forward this subject is, that I have been obliged to make myself acquainted with the requirements and circumstances of, at least, one tropical climate, that of Bombay. The Government of Bombay proposed in 1864, to erect the European Hospital in that city, from designs which I had submitted in competition. This led to my visiting Bombay at the end of that year, and to my being associated with Mr. Trubshawe, the consulting architect to the Bombay Government, in the preparation of working drawings for several public and other buildings of importance: I can therefore offer you the results of some little practical experience; and I hold it as almost a bounden duty of any member of this body, whose practice has led him to acquire information not readily accessible, and likely to prove of some use, that he should come forward here, and contribute it to the common stock.

It may provoke a smile to say that the great peculiarity of a tropical climate is, that it is very hot there, but, nevertheless, that *is* the great peculiarity, and the one point an architect must never forget, remembering that even what is called the cold season, is far hotter than our summer. It is also very light in such a climate; at some period of the year it is further very wet, the rain falling at times in torrents, and the air being saturated with moisture; but in the fine season it is ordinarily uninterruptedly fine, remaining so for long stretches of time. Climatic disturbances, however, when they come, are violent; wind-storms, dust-storms, thunder-storms, with driving rains—perhaps earthquakes —must be expected occasionally; and such disturbances are more sudden in their visits, and more violent in their force than in our climate.

Insect and reptile life are far more prominent within the tropics than here. Household pests there include such formidable enemies as the cobra, the scorpion, and the white ant. The white ant is an enemy of the most destructive powers. It eats almost all kinds of woods, and if the timber with which a house is built be such as it will devour, it will be not unlikely that all the woodwork of the house will be hollowed out and eaten away. The essential oils of one or two woods, such as teak and blackwood, seem to protect against them, but all ordinary wood is liable to be eaten by this ant. The damp of the monsoon time is a second powerful destructive agent; any unpainted or ungalvanized surface of iron, would be found oxidized to a remarkable extent; and whether it be this, or the saline particles of the air, or an extra dose of actinic power in the sunlight, I know not, but the climate of Bombay, though free from frost, appears to act almost as destructively on building stone, as that of London.

The people, again, who will be about you in the tropics, are essentially different from Europeans. They will be all, or nearly all, natives; and if in India, all of various *castes*. The number of servants will be very great; they will dispense with most things that an European wants, but on the other hand, they will require some things which in Europe would not be thought of. No English gentleman for example, would think of planting all round his private house, a sort of hamlet of little cabins for the wives and children of his servants, any more than he would dream of his valet being willing, under any emergency, to sleep on a mat outside his bedroom door, as a personal retainer might have done here in feudal times. In India both would seem very reasonable things. The people engaged on the work will also differ altogether in their notions of workmanship, and especially of accuracy and finish, from the European artizans for whom we are accustomed to make drawings. Their setting out will be defective, and their finish, to an European eye, faulty; but on the other hand, if the right sort of men be found out, and employed in the right way, their ornamental work, obtainable in India even now, after long disuse has caused the higher branches of the art of building to languish, will be very beautiful, and much of the workmanship excellent. The joinery and cabinet work especially, executed with very rough tools, and put together without glue, will surpass most English work for solidity and durability.

To return, however, to the *heat* and light. Where the sun's heat is so powerful that nothing but English pluck prevents the attempt to work being altogether given up, and between sunrise and sunset it is almost impossible for an European to expose himself safely to his rays—where walking a few hundred yards, at mid-day, even under an umbrella, would be an exhausting and imprudent exertion for an European—where fresh air is the greatest essential of comfort, almost of life—where the glare of light is so intense, that the smallest unshaded opening seems, in the hours of sunshine, to admit more brightness than is compatible with comfort—and where the main walls require to be screened, both from the pelting heat of the sun in the fine season, and the driving rains of the wet season, it is almost self-evident that rooms should be large and airy, windows and doors so open as to admit every breeze that blows, yet so shaded as to keep out as much of the light as possible, and that walls should be far thicker than is here necessary, and sheltered by some outer screen.

Outside all the external walls, or at any rate, on all sides open to the sun's rays, a screen called a verandah is essential, and it becomes, in fact, the leading feature of buildings for the tropics. This may be best described as something like an external cloister, ordinarily about ten feet wide, the roof usually running over it in a continuous line, and over-hanging it. The verandah is, of course, often constructed of slighter materials than the main wall, but where practicable, it is better to be of masonry. It is of course desirable to have it as many stories in height as the building, and covering most or all of the wall, but it admits of many variations, corbellings, projections, breaks, &c. The floors of the verandah should be water-tight, and should slope away from the building. Towards the quarter of the wet winds, it will be well to provide means of partly or entirely closing the openings; this is usually effected by temporary matting, and some permanent contrivance for the purpose, is rather a desideratum. In the day time the floor of the verandahs, as indeed that of the rooms, is often sprinkled with water for coolness. These roomy appendages are not all lost space, advantage is taken of them when in shade, or catching the passing breeze, and then they serve as workrooms for native workpeople, or for lounging, smoking, walking, and even dining and sleeping in; Indian life, being much *al fresco*, and privacy little studied, compared with comfort. The verandah, with its unglazed openings, its deep shadow behind them, and its overhanging roof, affords the chief, and a remarkably fine opportunity, for external architectural treatment in any building for the tropics. In some of the more artistic native houses, it is beautifully treated in carved wood. As an example of the treatment of it in masonry, I may refer to the Mahommedan buildings at Ahmedabad, shown in Mr. Hope's photographs, or to the fine design of Mr. Burges, for the Bombay School of Art, which exemplifies excellently this, as well as many other points of the proper treatment for a building for the tropics. Allied to the verandah are corbelled balconies, and open oriels thrown out to catch the breeze and afford a cool evening nook; such features occur in the best Mahommedan work, and afford an excellent opportunity for picturesque treatment.

Behind the shelter of the verandah, the doors and windows should be spacious. The building should, if possible, be made to point so as to catch the prevalent breeze; for in the tropics, winds often blow with a wonderful regularity from the same quarter for months together. And the building should, if possible, be so arranged, with rooms *en suite* from side to side, and openings opposite to openings, that the wind may blow quite through it, having windows opening down to the floor, and doors placed opposite the windows, and both made wide and high. The necessity for a through draught, and the use as a thoroughfare all round the building of the verandah, have combined to exclude corridors almost entirely from dwelling-houses; and your life in an Indian bungalow (or house), is public to a degree that would here seem strange, and would, in fact, be unsuitable to a temperate climate.

The general plan of all buildings for the tropics ought to be, as will have been already understood, very simple, and at once compact and roomy. All servants reside apart, and few stores are kept in any house; consequently, buildings intended for residence are relieved from almost all that gives rise to great complication in Europe. The external verandah will be found to swell the bulk of the building extraordinarily, but then it is constantly used for every sort of purpose to which room space might have been appropriated; and it is also so capable of furnishing here and there an odd corner to be cut off for odd purposes, that it enables the architect to reduce greatly the number of parts into which the block of his building is divided, and to render the form as simple as possible.

Over this simple mass a simple roof should be thrown. If not a terrace, its pitch should be flat and its eaves overhanging, so as to give most shadow and throw the heavy tropical rains well off the foot of the walls. In many, perhaps in most hot countries however, flat roofs are the rule, their comfort during the hot part of the year being felt to overbalance their inferiority in the rainy season. The dome also forms a leading feature of many Oriental styles of building.

In one or two good Mahommedan domestic buildings which I visited, I found the stories but low. This, however, would not at all satisfy any European residents, or I think be suitable to our great need in a sultry climate, of all the air we can get. The ordinary height of a story is about eighteen or twenty feet; and stairs being a serious fatigue in a hot climate, buildings of many stories are not common. An underground basement is not usual, it would become a harbour for vermin and filth, and would be flooded or damp in the monsoon (or wet) season. The ground floor is usually not less than from two to three feet above the level of the surrounding earth, and raised on a solid terrace. This height is, I believe, chiefly given as a protection against moisture, and hollow floors are avoided because vermin and snakes would be sure to get into them. Many residences, where ground is plentiful, are only one story in height, and few buildings could conveniently have more than three stories. I may here suggest that the frequent use in hot climates of timber-built houses, of only one story high, may be in part accounted for by their being safer than any other in times of earthquake. This can hardly, however, be the reason of their use in Bombay. Between the ceiling of the top story and the roof there should be a space well ventilated and unoccupied, to keep the top story cool, a precaution often neglected.

It may be almost unnecessary to remark that no fire-places or chimneys are ordinarily required, and that kitchens ought to be, where practicable, an outbuilding apart.

Coming now to the openings for doors and windows, they will rarely require to be filled, inside the building or out, with a solid door or shutter. The ordinary window is a large casement hung folding, and each fold in two flaps; the flaps are divided into several heights and filled with louvres, like those of a Venetian blind, only finer, and capable of being set close or open; the ordinary internal door is of the same character. Internal openings are often, however, not even fitted with doors of this sort, but left as arches to be closed occasionally by the use of silk or open black wood screens, often of beautiful design, reaching only to the springing of the arch, and with a space of a foot in depth left clear underneath to admit a current of air along the floor. This substitution of some sort of pierced work for panels, I may observe, is carried out in many directions. In some of the beautiful Mahommedan buildings the panels of pierced brass work and pierced stone which occur in the openings form the most beautiful decorative feature conceivable. These have been elaborated in such a case as the window in the Mosque of Seedee Seyeed, at Ahmedabad, to a point which challenges comparison with our most complete tracery. Other modes of filling openings may be used; for example, in Cairo and many other Eastern cities the most effective grilles for filling windows are formed of small turned wooden spokes fitted together in a simple effective way. In the Egyptian Okel, in the park of the Paris Exhibition, this was well shown as were other peculiarities of structures suited for hot climates.

In most or all tropical climates, it is at times necessary to keep *out* the wet, and sometimes even the air from external openings. I believe indeed that in some very hot inland regions, away from sea breezes, the air is so hot during the sunshiny hours that it is customary to keep it *out* instead of letting it in. Here of course external openings are made capable of being thoroughly closed, and comparatively small. It also is necessary in some districts to be able to shut out night fogs, or sea fogs, or some other injurious state of the air, and even cold winds; and in Bombay, which is on the sea shore, I found that it was necessary to be provided with the means of closing external openings against the humidity of the monsoon or wet season, and even against driving dust; accordingly there all window frames have two sets of folding casements, one with the Venetian louvres already described, the other glazed, and kept folded back out of the way except in the wet season. I am not aware that our sash windows have ever been attempted to be employed, and they are just such a contrivance as I should expect would be ill carried out by native workmen. Casements in solid frames are preferable, and those frames that I have seen, internal doors as well as windows, are always framed with a cill, which in doorways you have to step over.

It is not, I think, usually requisite to make provision for strongly protecting any building for European occupation against robbery. It is usual to have watchmen patrolling round even private houses all the night, and more reliance is placed on them for protection than on fastenings or doors.

Notwithstanding the general simplicity upon which I have insisted, one or two points in the arrangement of buildings where Europeans are to reside, in India, at least, often cause some perplexity to the architect; but these it is imperative he should attend to. For instance, the bedroom of any European entitled to the smallest comfort must have appended to it a bath-room, in which stands, on a large cement platform with a raised ledge, a large sponging bath: this has to be daily filled by a water-bearer: often it is so placed as to be filled through a pipe, without his actually entering the room; but however this may be, the arrangement is not that water is laid on as in England, but that it is brought daily, in a skin, on a man's shoulder to the outside, if not the inside of the room. For this purpose, consequently, access must be reserved for the Bheestie (or water-carrier). But this is not all. In or adjoining each dressing-room is a convenience taking the place of a water-closet. The system of water conservancy is not established, and may probably never be found available in India; while even the more suitable system of Mr. Moule and his earth-closets would not obviate the necessity of removing, more or less frequently, fæcal matter by hand. This is at present done twice daily, and the persons whose business it is to do this work (and who are termed sweepers) must not, both on account of the offensive nature of their work and on account of their lowness of caste, come into the building so as to risk their contact with higher caste servants. Hence it becomes necessary to provide a sweepers' staircase, and often several such (which are very frequently external staircases), more or less open, with means of access along verandahs or otherwise to the external wall of each dressing room, and to form at each convenience a small doorway through the wall. In a complicated building this necessity for a dressing-room to each bed-room, and for a secluded and external access to each dressing-room for the water carrier and the sweeper, makes no inconsiderable demand on the ingenuity of the architect and even on the space at his command. I may add that as regards bath water a regular system of drain pipes to carry it off does not seem usual. Provision is made for discharging it by some simple outlet to the exterior of the building, where it flows over the surface of the ground, and soon sinks in or is evaporated by the sun's heat. Here it may be fitting to add, by the bye, that eaves-gutters and down pipes, and means of storing rain water do not seem to be in use.

Another peculiarity of tropical life is that as every European who can afford it must ride to his business, and about his business, or his pleasure, every building requires a carriage porch, sheltered from the wet of the monsoon and the heat of the other seasons. Every house and most public buildings will also require stabling and coach-houses. These are very much ruder than our own, but must be spacious.

Special attention must be paid to the great value of one aspect as compared with another—the breezy and the shady sides of a building are preferable to the other aspects in a very great degree, but the difficulty of securing a good aspect for as many rooms as possible in a building being not unknown in England, I will not enlarge upon it.

Wherever practicable, an Indian building is placed within an ample walled enclosure, called a compound, which is a kind of compromise between a meadow, an orchard, and a garden; and in this compound, when a number of attendants are required, nestles a cluster of huts where they and their families live, and other huts, such as the cook-house, where the household work is mainly done. In city buildings it is usual to give up the whole or some part of the ground floor to the servants, though in some buildings lately erected in the city of Bombay they, and the kitchen (called cook room), have been provided for in the topmost story. The number ef attendants required is very great. As a rule in all tropical countries native labour is cheap and plentiful; each individual does not do much, and the subdivision of labour is carried out to a perplexing extent. It is worth taking a good deal of trouble to arrange the stables and these servants' dwellings, so that they shall not come to the windward of the building they belong to,—that is, if the prevalent direction of the wind is known. Various bad odours are likely to arise there, and even the fuel burned in cooking in these places, being cakes of dried cow-dung, gives forth an unpleasant smell, and this or any other bad smell is peculiarly offensive in a hot climate.

Having now said something upon the arrangements and features desirable in a building intended for a tropical climate, we are next to consider some other peculiarities which may have to be provided for in preparing to execute such a building. The difficulties attendant upon the actual carrying out of any building in a tropical country are often serious. They are of two classes; those of a structural nature,—as difficulties relative to materials, to labour, to modes of working, &c., and those of what may be termed an administrative nature, that is to say, those affected by the peculiarity of arrangements, or want of arrangements, for getting building work done. It is not sufficient to prepare plans for a building, which would be a good looking and suitable one if it were built. It is also necessary that the plans and arrangements should be fitted as nearly as possible to the material and moral circumstances of the case. This necessity is too often overlooked, ignored, or at best inadequately met, and in consequence works well designed in this country have often been ill-carried out, abandoned or modified in a destructive sense abroad. There may be many things that would prove good if done, which yet cannot be done, and others which could be done, but which people cannot be got to do.

The structural difficulties mainly to be anticipated can be, I think, summed up in one word—*want of appliances*. There is in India, at least, no want of hands. Labour is plentiful and cheap there, and a surprising degree of some sorts of skill still exists in plenty also, and this is probably more or less true of every place within the tropics, where buildings of importance are likely to be needed by Europeans; but any appliances beyond the rudest for raising weights, putting materials in their place, fitting together unwieldy portions of a structure, or even building a scaffold or hoisting a block of stone, may be expected to be scarce. In a peculiarly un-English method many sorts of works are well carried on by the natives, who seem to retain, along with the ruder ways of common building, some lingering traditions of arts long almost disused in the cities chiefly occupied by Europeans. A building in progress is, however, a curiously uncouth sight to unaccustomed European eyes. The scaffolding, so irregular and insecure in its appearance, seems only fitted to fall, yet it does its work; vast crowds of half-naked work-people—those carrying burdens being mostly women—each bearing on her head a light load of what has to be transported; the mason squatting on the stone he has to dress, holding his chisel in the tips of his fingers, and dealing dainty taps with a small hammer, as though he were a sculptor finishing off a marble statue; the smith squatting over his fire, as though his feet must be among the sparks and cinders as well as his iron; and among them all the dusky overseer with long white robes, and perhaps an enormous red turban, perhaps a tall glazed cap, and on his brow bearing the distinctive mark of his favourite idol, advances with the most obsequious of bows, his posture intended to convey the idea of an entire devotion to your service—not always carried out by his conduct. On such a work as this, busy and active though it be, an iron bolt or a cramp or a joggle, not to mention a powerful crane or a crab, which here it would be the simplest possible thing to have, would be something of a difficulty even in such a city as Bombay; elsewhere it might prove a formidable undertaking, perhaps even an impossibility. Nor is sending things over from this country always a safe and complete resource, although it has to be largely practised. Every one knows how often when such things as iron-work, metal fittings, &c., are sent on to a building at home, there is something wrong. Bolts going somewhere where a spanner cannot be got to turn the nuts, things that refuse to match or to fit their place, are serious hindrances even here; but when the original foundry is four thousand miles off, so that either a clumsy makeshift made on the spot has to be adopted, or a delay of six months has to be endured before a casting sent in error or broken in transit can be replaced, it is obvious that every complicated appliance ought to be avoided where possible; and where not, that everything of the sort should be put together in this country *completely* before shipping, and that duplicates of everything liable to damage or loss ought to be provided in abundance. In reference to breakage I may, by the bye, remark that more of it occurs in landing than on the voyage. Castings will travel excellently well if stowed along with plenty of small coal, but their disembarkation should be specially superintended. The necessity of hoisting a large weight or fixing a difficult piece of masonry may prove an insurmountable obstacle; and the employment of anything that would be considered even moderately difficult in this country ought to be avoided, unless the architect have previously ascertained that the means of carrying out his intentions exist at the locality where his building is to stand, as in part they do in the larger cities and most active colonies. In short, in designing for the tropics the architect should suppose that his work is going to be carried out much as mediæval work was done, and without any modern appliances whatever; and how lightly such a limitation need sit on a true artist may be easily understood by recollecting how grand and how perfect were the buildings which our predecessors erected in an age when steam cranes, travellers, and railways were unknown, before iron had been introduced into buildings, and when roads were bad, and hoisting little understood.

The materials obtainable in any tropical locality will be sure to differ somewhat from those at home. As a specimen I will give an account of what is obtainable in Bombay; and here let me say that Bombay must be taken as on the whole a very favourable specimen of an Indian city. It is the capital of Western India,—fast becoming the greatest commercial emporium of India, is a city of great wealth, possesses a population of about a million, rapidly increasing, and has one of the finest harbours in the world; whatever therefore is wanting in Bombay will not be likely to be better supplied elsewhere.

This island is volcanic, and no stratified stone seems procurable there or for many miles round. The ordinary building stone is a very hard rough slate-coloured basaltic trap, quarried with difficulty, all having to be blasted, chiefly used in stones of small size as rubble, laid with plenty of mortar, and plastered externally. It will make good but rough rubble work if squared up, but much of it proves to be perishable when placed in a building. For dressings and ashlar there is a scanty supply of one or two varieties of yellowish trap stone, called Coorla stone, of a hard unyielding nature, very difficult to procure in large blocks. A brownish granular limestone, closely resembling the worst qualities of Bath stone, and known as Porebunder stone, is imported by sea from the coasts of Kattiwar, a distance of some 300 miles. This is the best available material for mason's work in dressings or architectural features, but it is liable to discolour after being some years in a building; it is often defective, and it is so costly that on any large work it would probably be a saving to import Bath or Caen stone from Europe. Native bricks are very dear and small, being thin, like Roman bricks; they are mostly defective, but are available for internal use; bricks of English pattern are brought to Bombay some thirty miles, from Callian, but are even dearer than native bricks, and not very satisfactory, and I know of one instance at least where the facing bricks of a large proposed building have gone from England to Bombay. The fact is, that good material and fuel for brick-making are both equally scarce. A coarse spongy conglomerate known as kurial is occasionally used for filling-in and internal walling. I believe it to be a species of coral, and it is probable that some coralline material may in many tropical localities be obtained of a serviceable quality. Gravel there is none; for sand there is only sea sand, which at Bombay is not silicious, but ground-up basalt rounded by action of water. Of course this would be different in many localities. Laminated stone there is none, so that any thin paving stones have to be imported from Europe. A rough paving of the local trap is in use, but is very expensive. Lime and timber are the two materials, which alone can be described as really excellent of their kinds. The lime is known as chunam, and is obtained mostly from kunker, a nodulous limestone found in the neighbourhood of Bombay, a small supply of best quality coming from shells. Where cement is required it has to be imported from England. For some purposes which are served by cement with us,—such as fillets and hips—a kind of temporary expedient called dammer is made use of; this is a sort of coarse resin mixed with oil, melted and paid on hot like pitch, with or without the addition of strips of canvas among it to make it hold better.

Flat terraced roofs are not so common in Bombay, either for the buildings of Europeans or of natives, as they are elsewhere in the tropics. Where they are used they are ordinarily of chunam, and very thick.

For all carpentry and joinery, Bombay, like other parts of India, has recourse all but exclusively to one material—teak timber. This wood is extremely tough and strong, and can be got in great scantlings. It is hard to work, but has the three cardinal virtues, that the ants do not eat it, the rainy season does not rot it, and when seasoned in India the Indian sun does not warp it. Wherever teak is procurable, the designer of buildings for the East will do well to employ it alone, unless he is sure that any substitute he proposes will fulfil all three of the above conditions. Timber is often used by the native builders for such purposes as joists and rafters, in the form of unsquared round poles, or some other rough shape. The best teak is from Calicut, the next quality from Moulmein. Black wood, which rivals teak in its indestructibility is only used for furniture. There is plenty of rough timber to be procured for ordinary and temporary purposes, but not proof against the white ant.

The native tiles are an exceedingly bad roof covering: and nothing but the extreme difficulty of obtaining those substitutes which would be an improvement has caused them to be retained in European use. They are of very thin red porous tile, and almost semi-cylindrical in section, and about nine or ten inches long. They are laid fourfold in thickness, and except the eaves course are laid quite loose on the roofs, and are consequently so easily decayed and damaged, that a relaying of them, called tile turning, is an annual part of the preparation for the wet season. Galvanized corrugated iron has been imported to some extent from England, and is sometimes used as a roof covering; it is not altogether well suited to the climate, but is an improvement on the tiles. Where used for roofing, it ought to be employed double, with an air space of ten or twelve inches, with free access for ingress and egress of air between the two skins, and then it is found to form a tolerably cool roof.

All metal fittings must be of *brass* to withstand the damp of the monsoon time, and if they are to act at all as Europeans like hinges and latches to act, must come from Europe; so must window glass, and marble or tile pavements. The ordinary material available for floors is a filthy pulp of cow dung, laid by native women, who spread it about with their hands, often jewelled, with great unconcern. I must admit that this unsavoury mess quickly hardens into a good and inoffensive floor; but it requires renewing with fresh applications of the material almost fortnightly. Tile floors, or chunam floors, are of course preferred by Europeans, but they are disliked as being cold to the feet by the native servants, all of whom go bare foot.

Window glass is, I believe, obtained solely from Europe, and till lately came only in small panes. Rolled iron joists, to be used in a flooring similar to that of Fox and Barratt's patent, are to some extent imported; but the excellence of teak as a material for joists leaves room to doubt whether the ordinary floor, which is constructed with a sort of concrete filling in between teak joists, is not quite as good. Dennett's arch, perhaps used in connection with Phillips' girder, and Ransome's artificial stone, seem both of them appropriate inventions for use in cities within the tropics, but are less available in Bombay than elsewhere, owing to the absence of good sand or gravel, or of any fair substitute. Terra cotta as a substitute for stone dressings has been to some little extent introduced, and promises to be very serviceable. Laths are not forthcoming; the split bamboo, which is the best substitute, is liable to be eaten by the white ant, and this is, I presume, the chief reason why plastered ceilings are very unusual. Their place is usually filled by boarded, and often by canvas ceilings. Plastering in chunam on walls is coarse and soft. As papering is unsuitable (it would harbour insects) the ordinary finish is an inferior kind of distemper. The saltness of the sand renders the walls hygrometric, but if damage from damp could be guarded against, a treatment like the interiors of Pompeii would be the proper internal finish. There is a very superior sort of chunam plastering known as Madras chunam. It very closely resembles fine Parian cement, but is so expensive as not to be often employed.

Plumber's work is all but unknown in Bombay, except occasionally for water pipes. Gas fitting is, however, now in use there, as gas has been lately introduced, and would have now to be provided for in arranging buildings for that city.

I have, I think, in this list said enough to show that a building intended for Bombay, even if designed in accordance with the climate, but requiring for its erection large blocks of stone, landings, or even much iron-work, or such things as slate slabs, panes of plate glass, or flat tiles for floors or roofs, would have to be modified on the spot, in respect at least of those parts—unless all required was sent out from England; and though, perhaps, some of the localities for which the services of an English designer may be required will be better off than Bombay in some one or two particulars, it is more than likely that they will be worse off in others, so that an acquaintance with the material resources of the place, and the utmost anxiety not to overtax them, is required of every architect of a building for tropical climates.

The administrative difficulty is, however, likely to be greater than the constructive in any case that may be probably have to be encountered by any of us, and is much more likely to be overlooked or misunderstood by an architect who has never travelled beyond the limits of Europe.

The available modes of carrying out a building abroad, as at home, are of course either through contractors, or by engaging labour and buying materials. Native contractors of some sort will be found in most large Asiatic towns; and in many places, where there is an extensive European settlement, English or American contractors are to be met with. Where it is probable that the works will be carried on by them, it is important that the documents sent out to explain the architect's intentions should be in such a form as they will understand. Here it may be worth while to add that, at least in India, the documents need not be translated into any foreign language; simple good English will be thoroughly well understood by those natives engaged. Specifications should be clear, distinct and full, and above all things free from such technical words as are not known to be in use in the place where the work is to be done. Drawings should be very full and clear, and should bear on their face written directions as to what is intended by any difficult, or unusual, or intricate arrangement or construction. Simple bills of quantities will ordinarily be valuable, but they should not be taken in much detail. They should also afford more means of tracing on the plans the work which they describe than is usual in England; and where much work has been done under the Royal Engineers, so that the contractors are accustomed to their routine, it may be advisable to throw the bills into the shape ordinarily employed by them, and which are taken very much in the gross, and are arranged to exhibit on the same page the dimensions as well as the result of each of the few measurements made use of. This will be not only advisable, but probably necessary, if the work is under any colonial government.

In many instances it will not be possible for work in the tropics to be contracted for, and it will be done by day labour. If the English architect has to find some one to take charge of such an undertaking, it will be most desirable to get a superintendent, not only familiar with the work, but also acclimatized to the country, and used to dealing with natives. If these points are neglected, or any one of them, the work will run a great risk of being entirely stopped. Upon the risks due to ignorance of the work, I need not enlarge, but it is as well to note that if the superintendent is unfamiliar with the climate and imprudent there is every risk of his being seized with fever, or sunstroke, or some other violent ailment, such as besets a hot climate, especially where there is exposure, and so laid aside; or, if this be escaped, the work may be equally hindered by the superintendent being imposed upon by the craftiness of the natives, or by his blundering through ignorance upon something distasteful to the natives engaged. As, for instance, I have heard of a very extreme case of an entire work being deserted by all the men engaged upon it, owing to the European superintendent having laid his hands on one of the workmen, whose notions of caste was thereby outraged. Such a thing as this may seldom occur, and the narrative may have been exaggerated, but the unwary agent will be extremely likely to be overreached by the craft or overpowered by the caste combinations of natives, which last are quite as formidable as our own trades unions, and even more unanimous in action.

If the work is for any colonial government, the probability is very great that it will be handed over to an officer of Royal Engineers, to carry out by day labour; or, as it is officially termed in India, departmentally. Large numbers of plain buildings, such as barracks, are executed by the officers of this body from their own designs, according to plans and estimates prepared by themselves, they purchasing the materials and employing labour; and their system for doing this work appears to me admirably well organized for this purpose; but any one who has had experience of it will fully understand that neither architecture nor building is the proper function of military engineers, and that as an executive this corps is not suited to the requirements of work of high architectural pretentions, and that it hardly seems giving military officers their proper position to employ them upon the carrying out of any work except from designs prepared by the officer engaged. At the same time that I make these remarks, I must add that this corps contains individual officers who have distinguished themselves in India as architects by their designs and executed works; and that they have been pioneers in the work of constructing in that country buildings for European use. They have excellent facilities for procuring from England such articles of European manufacture as they want, but perhaps have been themselves led by this very facility, and by their example have led others, to neglect the cultivation of the resources of the country. If the proposed work be government work, it will be in some way, and probably in every way, under the Public Works Department, wherever, as in India, such a department exists, and taken in hand by the military engineers of that department: and the great evil which, in that case, the architect has to fear, and if possible to guard against, is his work being wholly or in part modified, set aside, or superseded. To prevent this, the precaution should first of all be taken of being quite sure that there is nothing which will *require necessarily* to be set aside; nothing manifestly unsuited to the climate, to the materials of the locality, or to rude and imperfect workmanship and means of execution. The architect should, secondly, be quite sure that there is nothing which will require necessarily to be added; his drawings, while as little voluminous as he can make them, should be so comprehensive and complete as to furnish every detail, anticipate every question, and supply all needed information. Thirdly, he should be quite sure that all his documents are regularly in the form customarily used and understood by the engineers, especially his detailed estimate; to use a homely phrase, he should send out the whole thing cut and dried. Lastly, he should omit no opportunity of getting any official sanction, and mark in the shape of seals or signatures on the drawings, or official and thoroughly formal minutes and memoranda in their favour, as he can by hook or by crook obtain from any one in authority. The reason of this last suggestion is that in India, and more or less in all colonies, very frequent changes in administration occur; so that if the official sanction of an officer be not obtained early to anything which he has agreed to and ought to sanction, there is a great risk that he may be suddenly promoted or transferred, and the matter fall into the hands of a successor, who, if not bound by the official action of his predecessor, may take some totally different view, and upset all that has been done. This labour, you will perceive, is greatly in excess of what is required upon an English building up to the time of sending away plans, and it requires to be well remunerated. It is considered by those best qualified to judge, that if thoroughly well done, the work on a proper set of plans, &c., of this sort, equals all that is wanted here up to the time of making contract, with the addition of about half that which is subsequently done by the architect here during the time of his superintendance of the building.

I may add that the Government of Bombay has officially recognized the scale of professional charges issued by this Institute. It is, however, quite possible that, at least in the case of architects residing and practising in India, these rates ought in fairness to be increased, for it is, I believe, customary for the members of other professions to charge double the English fee for their services. At least this is understood to be the practice of physicians, solicitors, engineers, &c., at Bombay, and probably therefore will be the rule in other parts of India.

But to return to the agency for executing works. There can be little doubt that in the case of any very large work, the employment of an European contractor of energy and skill, furnishes the best guarantee for the good and rapid execution of the work; and any members of this Institute who have heavy works in tropical climates, will do well to urge on their clients the great advantage, almost the necessity, for employing the best English contractor who can be found, making liberal terms with him, and stipulating for his sending a representative, to be on the spot, experienced in work, used to deal with natives, and already accustomed to a tropical climate. It will, however, only seldom happen that a work is important enough to tempt a good contractor from England, and European contractors settled abroad, or the native contractors, will, usually, be the agency best to employ; and of these, probably, native contractors will as often as not, be found the most useful; but in either case, it cannot be too much impressed on the architect whose designs are to be carried out by hands used mainly to different work, and certainly unused to him, that the instructions conveyed by his plans and documents, should be very full, very lucid, and quite unmistakeable; and that simplicity should regulate and pervade all his contrivances and arrangements.

There still remains the ultimate question, and the most purely architectural question of all. What aspect, as works of art, shall we, as artists, strive to impress upon the buildings, whose arrangement and construction we have been considering? I shall not attempt to examine this question at all in detail, but cannot forbear raising it, for the art of any building is undoubtedly the one element, whatever value we may put upon it, which concerns us architects peculiarly, and almost exclusively.

All classes of builders require to understand materials and construction. Many unprofessional men require to comprehend the arrangement of buildings and organization of works. Professional men in other branches of the great building art are called on both to comprehend and carry out all these, but it is our special honour, that to us is committed the charge of those works, which it is desirable to render, not merely serviceable as structures, but impressive as monuments; that of us is expected indeed, a work of skill, and not merely a work of skill, but also a work of art. I hold that the solution of this question. lies first in the adoption of a type essentially European; and, secondly, in the retention, and blending with it of such admissible features as are to be found in the best styles of architecture that have been elaborated already in tropical climates.

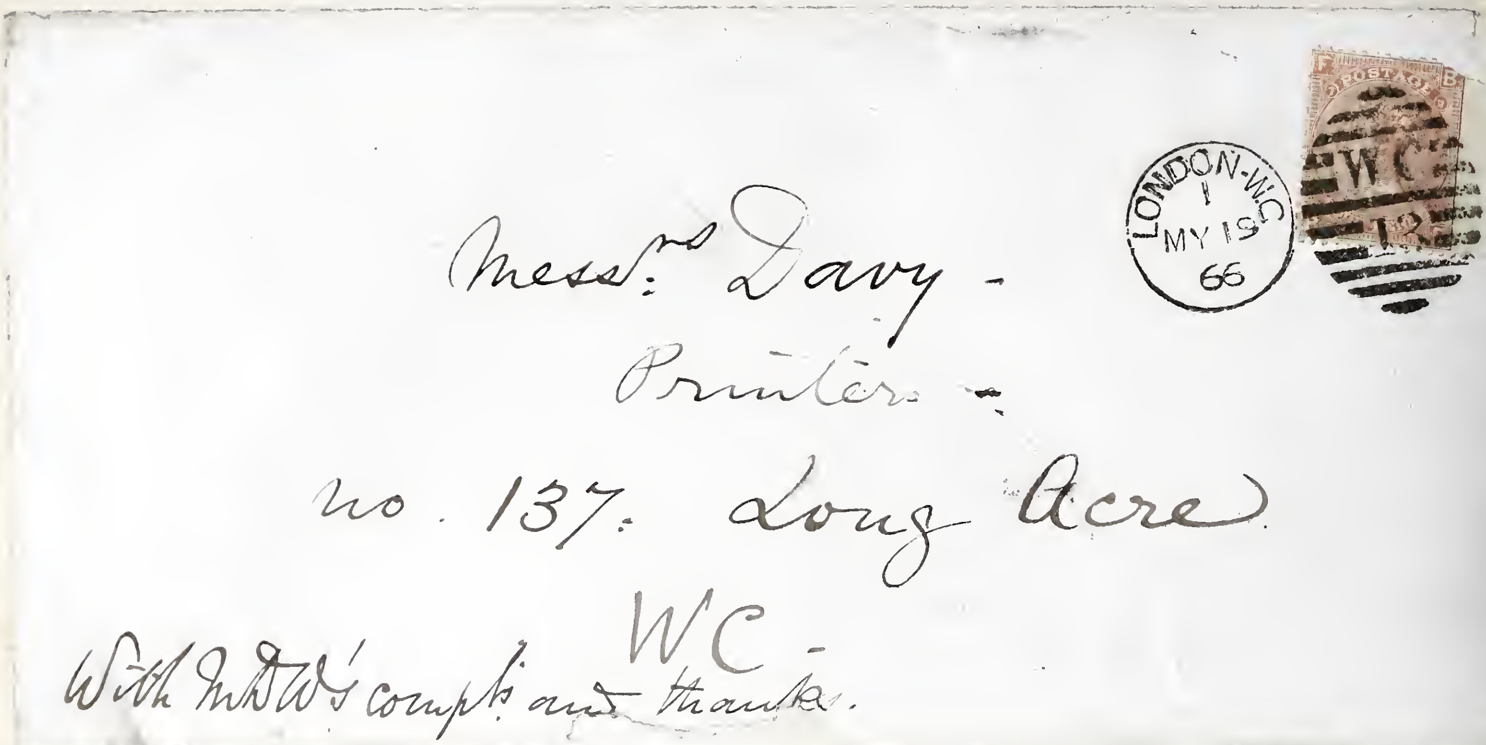
Had we a distinctive modern English style, we ought, unquestionably, to use it in our colonies, as the Roman did in his colonies, with such changes as local circumstances made necessary. But though this is, unhappily, denied us, there are in existence distinctive European styles; and I hold very strongly, that, as our administration exhibits European justice, order, love of law, energy and honour, so our buildings ought to hold up a high standard of European art. They ought to be European, both as a rallying-point for ourselves, and as raising a distinctive mark of our presence, always to be beheld by the natives of the country.

As far as I have seen it, most of our building work in the East is not creditable to our taste, though it bears witness to our energy and vigour. It is unmistakeably European, but of a very bad type. Now, the proper corrective is not, I hold, the direct imitation of Asiatic types, but the adoption of those European styles which have grown up in sun-shiny regions. Such styles are ancient Roman, or even Greek (when adequate materials and workmanship are procurable), or the Renaissance and Gothic of Southern Italy or Spain, or the early Gothic of Southern France. In treating any of these styles, and still more, in treating any more Northerly modifications, a leaning towards the peculiarities of the best Oriental styles is desirable. Among these peculiarities, the following may be enumerated as frequently found. Walls of ample thickness, often covered with a profusion of delicate surface ornament, frequently beautifully coloured; an absence of such vertical breaks as buttresses, and a prevalance of horizontal cornices, and level projections; openings, usually wide and frequent, artistically grouped, often filled in with exquisite pierced patterns; mouldings infrequent; balconies and various sorts of corbellings, covered usually with carving; roofs of low pitch, flat or domical; walls, often replaced entirely by lines of piers or columns; for the most part, and with some notable exceptions, moderate height, but usually great extent and elaborate surroundings. The whole has an aspect of breadth, of richness, and of ample shade.

In concluding, I should like to throw out the hint, that these peculiarities may be found worked out in the most perfect manner, and with complete adaptation to the exigencies of a fiery climate, in the best of the Mahommedan buildings, which mark, as I should like ours to do, the residence in India of a conquering race—a race, alas, far more artistic than we, and whose works are nobler monuments of art, than it can be hoped ours may be. Many of the finest of those fast-decaying and ill-protected works—those at Ahmedabad—are partly represented by means of photography, and so available for study; and if in addition to affording such information, as at least a few of our members may find useful and interesting, I shall have succeeded, by again pointing out these works (which have been already described here), in inducing architectural students to dig in this hitherto all but unexplored mine, I shall have the gratification of knowing that this paper has not been quite barren of results.

The usual vote of thanks having been passed to Mr. T. R. Smith for his interesting Paper, the Chairman (E. B. Lamb, Fellow) expressed his regret that the late hour of the evening precluded the possibility of immediate discussion, but suggested that it should be deferred until a future occasion.

The proposition having been approved by general assent, the meeting adjourned.



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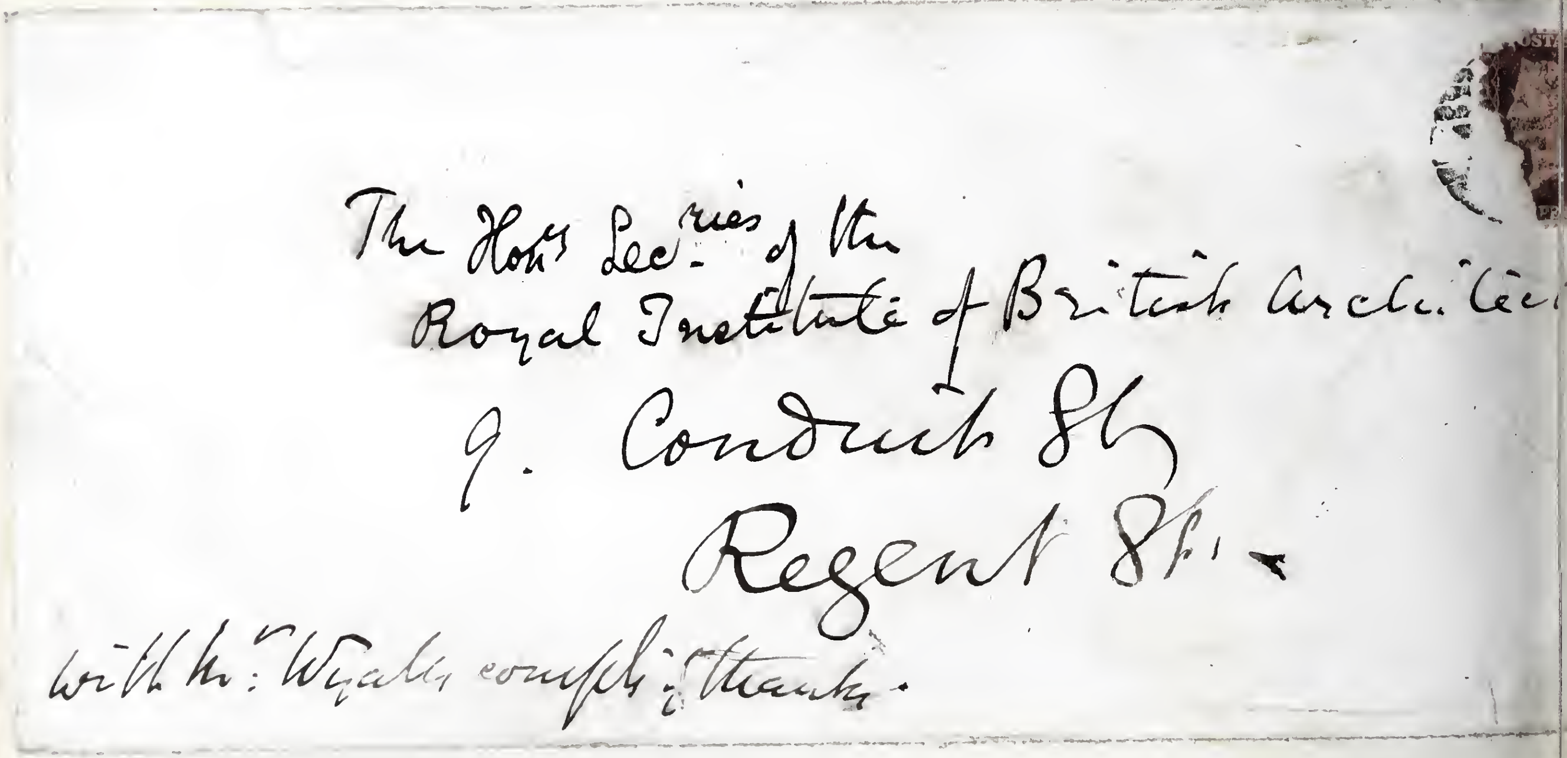

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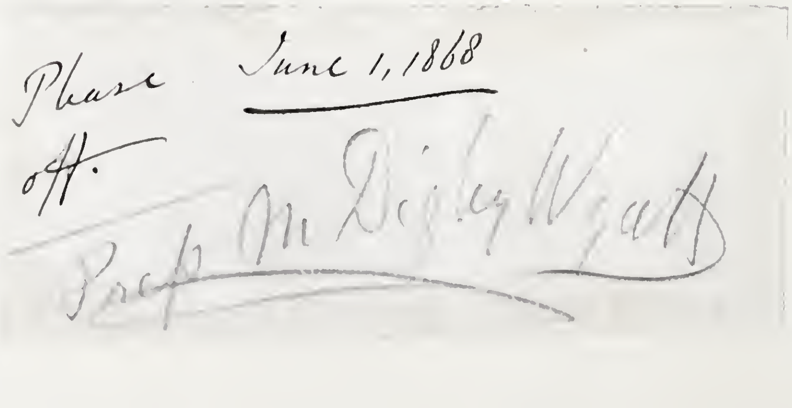

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June 1, 1868

Prof M Digby Wyatt

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 18th May, 1868, W. Tite, M.P., President, (afterwards C. Barry, V.P.), in the Chair, the following Paper was read:—

ON THE FOREIGN ARTISTS EMPLOYED IN ENGLAND DURING THE SIXTEENTH CENTURY, AND THEIR INFLUENCE ON BRITISH ART.

By M. Digby Wyatt, Fellow.

Of every leading phase of Art there are invariably three conditions which especially attract and repay investigation. One is that of birth, or creation; another, that of manhood, or the highest state of development; and yet another, old age or decrepitude. What writers have designated as transitional periods in the history of Art generally consist of the junction between the decrepitude of one phase and the birth of another. Yet this is not always so, for, as in the transitional period, which will engage our attention this evening, it sometimes occurs that the decrepitude of one phase of Art, by contact with some wandering elements of the manhood of a contemporary style, reared under different and exceptional circumstances, is, as it were, revivified; and acquires strength to engender such striking modifications of the compound elements so brought into abnormal contact as really to constitute the birth of an entirely new phase of Art. To follow out any such rare concurrence of agency, and recipients of agency, it behoves the student to realise distinctly — first of all, the nature of the decrepitude acted upon; secondly, the nature of the manhood brought into action; and, thirdly, the nature of the spark struck, as it were, by the impact of the flint upon the steel, and of the fierceness of the blaze thereby produced.

To apply this analogy to the matter in hand, we may assume as the phase of Art in decrepitude, the Gothic system as it existed in this country, and indeed in most parts of Europe, towards the close of the XVth century. The vigorous manhood, full of life and strength, which existed concurrently and exceptionally with this Gothic decrepitude, was the great school of the Italian Renaissance. The sparks struck in this country were the few brilliant works executed by what we may call the original missionaries of this great school; and the ultimate blaze was the final ascendency and triumph, under one form or another, of the general principles of the revival of classicality. It is in this order, and subject to such general heads of historical succession of cause and effect, that I propose to deal with my theme this evening.

Let us begin, therefore, by a brief examination of the aspect presented by English Art at the close of the XVth century, dealing in rapid succession with its leading elements—architecture, sculpture, painting, and industry involving design. With respect to the first-named, I need scarcely remind you that the style which prevailed during the fifteenth century in this country was what is generally known as third-pointed or perpendicular, and that common consent has now recognised that that style was less beautiful than either of the other styles of mediæval architecture which preceded it.

No architect well acquainted with our chief national monuments will be inclined probably to demur to this proposition, but the most judicious will be likely to admit that much too severe a censure has been passed upon third-pointed architecture by those who idolise first-pointed only. In all that relates to domestic enjoyment great progress had been made, and beauty never failed to accompany the judicious supply of necessity by our forefathers of the XVth century. In the lofty towers which they raised, such as those of Gloucester and other cathedrals, of Taunton and other churches, they showed themselves capable of noble works involving at once hardihood of construction and great command of technical resources. Yet in all this daring and ambition, this lavish expenditure of skill and money, there is ever present a monotony of design, which betrays a following of tradition rather than a leading assertion of individuality. The elaborate system of freemasonry, while it enabled the stone-cutter to work out the lines of the most complicated intersections, appeared to fetter his imagination, leaving it free to follow out only the intricate problems it was the special function of freemasonry at once to generate and resolve. Hence simplicity was lost sight of, mannerism prevailed, and "quips and conceits" began to usurp real dignity in national Art. Still there prevailed on special occasions a largeness of conception as to main structure which ought always to command respect. This showed itself mainly in the grand chapels, of great width and height, lighted by windows of vast extent, and covered with fan-tracery vaulting of remarkable merit in technical execution, as well as to my mind, in grace and beauty of design. It is in this particular, I believe, that architectural decadence was least conspicuous in the XVth century. The prototype of this class of chapel was the Beauchamp, at Warwick (A.D. 1439), followed by Eton College Chapel, St. George's Chapel, Windsor, and, at the junction of the XVth with the XVIth centuries, by Bath Abbey, Henry VIIth's Chapel, at Westminster, and King's College, Cambridge. With the two last in England ended the real domination of Church over State, and with the cessation of that domination the principles of mediæval architecture began to lose their ascendancy over the national mind. With the development of the principles of the Reformation, men naturally refused to put "new wine into old bottles;" and the country, beginning with Royalty, and proceeding through the chief nobles and successive Ministers of State, ripened for that inoculation of novelty from abroad, which, as we shall have occasion to see, rapidly supplanted the old systems of progress by spontaneous internal national combustion.

It is in the class of Royal monuments that we earliest recognise the insufficiency of the national Art of England, so generated, but sadly stunted in its growth by the cruel action of the enduring civil wars "of the roses," to keep pace with the contemporary onward march of Art in several of the other countries of Europe. A mere glance at the pages of Stothard's "Monumental Effigies" will be sufficient, I believe, to satisfy the student of the justice of this remark, and to prove to him how great a falling off in sculpture, as well as in architecture, separates the life-like and elegant figures and tombs of Henry III. and Queen Eleanor from such figures and tombs as those of Sir John Crosby, or the magnificent John de la Pole, Duke of Suffolk. It would be difficult, probably, to pitch upon a better illustration of the incompetence of native artificers to deal with sumptuous monumental work at the commencement of the XVIth century in this country than is afforded by the Chantry chapel, erected in Worcester Cathedral, in commemoration of the burial in that edifice of Prince Arthur, the dearly-loved son of Henry VII., in the year 1502. The funeral (from the account of an eye-witness, published by Hearne in his additions to Leland's "Collectanea") appears to have been one of extraordinary magnificence. The monument is of fair perpendicular design, but in no respect rises above the average of contemporary work. Mr. Bloxam, in commenting on this specimen, on the occasion of the visit of the Archæological Institute to Worcester, in the year 1862, remarks (Journal of the Institute, vol. xx. p. 351) that "it may be considered amongst the latest examples anterior to the introduction of the semi-classic school of Art." He goes on to observe that the sepulchral chapel in which the Prince's tomb is placed "is a rich specimen of the late Gothic work of the early part of the XVIth century. It consists of screens of open and closed panel-work, enriched with heraldic atchievements and devices—the rose, pomegranate, ostrich plume, fleur-de-lys, the fetter-lock, and portcullis—and imagery, but coarsely executed, and by no means to be compared with earlier sculptured accessories in the Cathedral."

Regarding this, as Mr. Bloxam has done, as a marked typical specimen, I did not hesitate to select a portion of it for reproduction in the small cloister of the Mediæval Court at the Crystal Palace.

It does not appear that a sculptured effigy of this much honoured Prince was ever attempted, probably from a sense of difficulty in finding a sculptor capable of worthily representing England's hope and pride cut down at so early an age; but by means of the sister art of painting his lineaments have been preserved to us in the celebrated stained glass window in the fine old church of Great Malvern. An admirable engraving from the portion of the window exhibiting the Prince at his devotions, before a fauld stool, under a canopy surrounded by hymning angels, is given in Shaw's "Dresses and Decorations." This picture, which appears to have been executed in the year 1502, immediately after the Prince's marriage, although characteristic in its forms, and an evidently naturalistic portrait, betrays scarcely any acquaintance with the laws of perspective, and a total disregard for light and shade, as elements of pictorial representation. Corresponding faults are exhibited in all of the contemporary illuminated manuscripts executed for Englishmen I have been able to examine, not manifestly of Burgundian or Flemish origin. Such English manuscripts are often agreeable in their ornamental features, but break down sadly when the "lymnour" ventures upon higher ground. That foreigners were working on the best class of MSS. in England during the latter parts of the XVth century is proved to us by such inscriptions as that given at the end of the Royal MS. Reg. 19, c. viii., which is as follows: "Explicit l'imaginacion de vraye Noblesse parachevé le dernier jour de Juyn au Manoir de Shene (the Royal residence, subsequently called Richmond) l'an mil cccc.iiij^{xx} et xvj par *Poulet.*" A comparison of the miniatures of this volume, or of Henry VIIth's prayer book, with those of John Rouse, the author of "The Warwick Roll," will at once illustrate the difference between English and contemporary foreign painting of a similar class. I would here gratefully acknowledge the assistance I have received from Mr. Bond, the learned Keeper of the Manuscripts in the British Museum, in my investigation of this part of my subject. I enjoyed the privilege of looking over the most typical specimens of illuminated MSS. which had belonged to British Sovereigns with that gentleman; and with every desire to trace an English, rather than a foreign, hand in the grand folios which once formed the staple of the library of Henry VII., I fear I must confess that we concurred in regarding our search as fruitless. Through all that series of volumes there runs a family likeness as well in the style of writing and ornament as of painted miniatures; and the fact that the colophon of one of the set bears testimony to the fact of the book's having been produced at Bruges is fatal, I fear, to the probability of any of the series having been produced in England. We could not but agree that, abundant as the evidence was that English illumination had held its own in originality and excellence, up to about the first third of the XVth century, materials were extant only for showing that subsequent to that period the English "limpnour's" skill declined in proportion as that of the artists of Germany, the Low Countries, and Italy, reached its point of culmination. This view we shall presently find corroborated by the mention of some of the distinguished foreign illuminators retained in the service of Henry VIII. in England.

Turning for a few minutes to the condition of the industrial arts in England during the latter part of the 15th century, we have to recognize that in no branch was a higher and better level attained than in those connected with structure. Masons, carpenters, smiths, and tilers, abounded all over the country, and in every nook and corner fair work was done: at the same time we must acknowledge that in point of design, for the most part the work was mannered, and never rose above a level of mediocrity. The traditions of good execution survived the civil wars, but the element of beauty seemed to have been "stamped out" by the passions of discord. In metal-work, especially silver smith's work, the native artificer was thoroughly efficient in ornament and process; but incapable of so rendering the human form, as to enhance by its introduction, the artistic effect of the object which grew beneath his hand.

In textile arts we were far behind both the Italians and Flemings, although in embroidery we held a fair rank. In ceramics, with the exception of encaustic tiles we were sadly in arrear of the great progress made in Italy in majolica and "della Robia" ware.

Glass making in England during the fifteenth century does not appear to have been at a very high pitch, since in the various accounts of glass used for the "royal service," the relative prices (quoted by Mr. Waring in his masterpieces of industrial art) are—"for Dutch glass, 4½*d.* per foot—Venice, 5*d.*—Normandy, 6*d.*—English, 1*d.* a quarrel, used at the works in Cole Harbour House, A.D. 1481." This difference in price alone might not suffice to prove the inferiority of English glass, as it might possibly have been both cheap and good; but coupled with the fact of the express stipulation made with John Prudde, the king's glazier, that for the windows of the Beauchamp Chapel, Warwick, he was "not to use any glass of England," it may be taken as proving the backward state of the manufacture. The cheapness of the English glass could not have been due to its abundance, since even in 1557, Charnock in his "Breviary of Philosophy" writes—"as for glass makers, they be scant in the land"—and goes on to specify one only, viz: at Chedingford in Sussex. Even as Charnock wrote the trade was on the eve of resuscitation in England, through one of the many foreigners who gave the new life to the country we purpose attempting to trace this evening.

In 1556, an emigrant from Lorraine, named Henzoll, started a glass house at Stourbridge, where his descendants continued in the trade until the end of the last century. Queen Elizabeth granted certain monopolies in 1567 to Cornelius de Lannoy and Jean Quarre of Antwerp, for the production of table glass, "such as was used in France." By the year 1589, when George Longe petitioned Lord Burleigh for trade privileges, as an Englishman, his petition recites that these foreigners had already procured the establishment of no less than fifteen glass-houses in this country. One of the conditions insisted upon in Queen Elizabeth's grant of monopoly was, that the foreigners should "teach the art to Englishmen, and pay crown dues."

Between the arts of a country and its contemporary educational systems, there is so obvious an affinity, that it would be to neglect an interesting illustration of the former to refrain from at least a passing allusion to the condition of the latter. Towards the close of the fifteenth century vigorous efforts were made by men, such as the learned Alcock, Bishop of Ely, to raise the standard of the English Universities and endowed schools, in emulation of those far-famed Italian founts of learning to which students flocked from every country of Europe. How greatly his efforts were needed is shown by Warton's testimony,* "that the foundations (alluded to) did not produce any lasting beneficial effects; and that the technical phraseology of metaphysics and casuistry still continued to prevail at Cambridge." This appears from the following anecdote:—In the reign of Henry VII., that University was so destitute of skill in latinity, that it was obliged to hire an Italian, one Caius Auberinus, for composing the public orations and epistles, whose fee was at the rate of twenty pence for an epistle. The same person was employed to explain Terence in the public schools. This function he performed but coldly, as we are informed by a cotemporary writer, whose comment "ut ea erant tempora" is pithy and conclusive; as showing, that that general ripening of the soil for fecundation from classic and foreign sources, which in its relation to Art we have to consider this evening, had not developed itself in England prior to the close of the fifteenth century.

This measure of torpidity, however, was but as night before day, as darkness before light; its very intensity serving by contrast to relieve in additional prominence the new and vivacious rebound which characterised the transition from Gothic to modern England.

One of the most delightful of modern writers on Antiquarian subjects, the Dean of Westminster, has touched with so skilful a pen his picture of "the pause and break in English history, of which Henry VII's reign is the expression," that I am tempted, in speaking of it, to use his words rather than my own. "It is," he says,* "the close of the middle ages; the apple of Granada, which appears on the king's tomb, is the token that the long struggle between Christians and Saracens had come to an end. It is the end of the Wars of the Roses. In it we see the union of Henry's right of conquest with his fragile claim of hereditary descent . . . It is also the revival of the ancient, Celtic, British element in the English monarchy after centuries of eclipse . . . The Tudor Sovereigns, uniting the quick understanding and fiery temper of their ancient Celtic lineage with the iron will of the Plantagenets, were the fit inauguration of the new birth of England at that critical season—for guiding and stimulating the Church and nation to the performance of new duties, the fulfilment of new hopes, the apprehension of new truths."

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* Warton's History of English Poetry, Vol. II. page 553.—Lond. Tegg, 1840.

The "new birth of England," to which the Dean no doubt specifically alludes, is that religious and intellectual movement of which the reformation and the spread of literature by the art of printing were the special co-relatives; but as it has grown into an axiom based upon sufficient precedent, that no "new birth" in religion and philosophy can take place in any country without occasioning many corresponding "new births" in arts, sciences, manners, and customs; so we may fairly conclude that the radically novel forms, speedily assumed by the monuments of the country under the Tudor Sovereigns, were but natural accompaniments and evidences of the "new birth" to which the Dean has so happily alluded. Our next stage in considering the nature of this new birth in Art will be to look briefly to the manhood of Italy and Germany which had sprung up, while England declined under the fatal wars of the Roses.

Like every other phase of Art characterised by extreme refinement, the progress of the Italian Art of the Renaissance was slow, and it is only through the labours of many generations of artists that we are enabled to trace its development. From the clumsy mouldings, stiff acanthi and other features of the rude architecture and carvings of the Lombard masters, such as those of San Michele and other churches at Lucca, and the painted ornaments of the catacombs, an uninterrupted chain of modifications may be traced, until we realise the elegant proportions and contours of structural features, and the playful treatment of conventional foliage which characterise the works of the best masters of cinque cento art. Corresponding changes marked the progress achieved at last in the pourtrayal of the human figure. The successful efforts of those artists were, in fact, carried on, but in pursuit of the light of classic art, of which the Lombard architecture and sculpture and the early Christian paintings reflected the last fading rays.

In the commencement of the thirteenth century was formed the celebrated Pisan School, awakening a spirit of art which, though Gothic in its details, bore still a powerful impress derived from the atmosphere of classic tradition in which its authors lived, and which spread rapidly throughout Italy. At Rome, about the year 1300, the family of the Cosmati embellished the churches of the capital with many graceful specimens of ornamental carving—principally in tombs, tabernacles, ciboria, &c. Somewhat later Masaccio flourished at Naples; and at Venice, Filippo Calendario, whose beautiful capitals and ornaments of the old Palace of the Doge have been the theme of admiration for every writer from Cicognara to Ruskin.

About the latter end of the fourteenth century a new spirit seems to have arisen, more particularly in Tuscany. The Gothic style which in that district had found favour in the eyes of Giotto, Orcagna, Andrea Pisano and other artists, almost entirely disappeared before the more direct imitation of the antique, which was mainly introduced by Brunelleschi in architecture, and in sculpture by Jacopo della Quercia, the remains of whose extraordinary fountain at Siena bear all the characteristics of the purest style of Roman workmanship. Not content with imitating classic sculpture, he exhibited in various works a singular naïveté in imitating "life," as indicated in the tomb of Illaria del Caretto.

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* Historical Memoirs of Westminster Abbey, by A. P. Stanley, D.D., &c., p. 158, 159, 160.

The career of Della Quercia may be regarded as the turning point in the history of Italian ornamental sculpture, as the lives and works of Masaccio and Andrea Mantegna may be said to have been in Italian painting, since they were the first of the actual cinque-centists—that is to say, of those artists whose works confer so great a lustre on the fifteenth century.

Della Quercia was, however, surpassed by Lorenzo Ghiberti, one of his immediate followers. Donatello again imparted a new life and vigour to the sculptor's art, which, in spite of all their beauty, were often wanting in the compositions of Ghiberti. The qualities of both these artists were happily united in the person of Luca della Robbia, who during his long life (1400-80) executed an infinity of works, the ornamental details of which were carried out in a style of the freeest and most graceful analogy with the antique. In the person of Filippo Brunelleschi, the talents of the sculptor and architect were combined; the former being evinced by his trial-piece for the bronze gates gained by Ghiberti, the latter by his work at the magnificent cathedral, and in the churches of San Lorenzo and Santo Spirito, at Florence. This combination of architectural and sculptural ability formed indeed a distinguishing feature of the period. Figures, foliage, and conventional ornaments, both in plastic and pictorial mediums, were so happily blended with mouldings and other structural features, as to convey the idea that the whole complicated amalgamation of the several branches of the fine arts sprang to life in one perfect form in the mind of the artist who executed it.

A development of taste coincident with that of Tuscany took place at Naples, Rome, Milan, and Venice. At Naples, the torch lit by Masaccio was handed on by Andrea Ciccione, Bamboccio, Monaco and Aniello Fiore. At Rome, the opulence of the Princes, and the great works undertaken by the successive Pontiffs attracted to the imperial city the highest procurable ability, and hence it is that in the various palaces and churches fragments of exquisite decorative sculpture are to be met with. Bramante, Baldassare Peruzzi, and even the great Raphael himself, did not disdain to design ornaments for carvers of the purest taste and most exquisite fancy. Of the perfection attained in this department of art by the last-named artist, the celebrated wooden stalls of the choir of San Pietro dei Casinensi, at Perugia, remain unquestionable evidence. The carrying out of these carvings by Stefano di Bergamo does full justice to the admirable compositions attributed to Raphael.

At Milan, the important works of the Duomo and the Certosa of Pavia created a truly remarkable school of art, among the most celebrated artists of which may be noted Fusina, Solari, Amadeo and Sacchi. The sculptor's talent had long been traditional in that vicinity, and there can be no doubt that these artists embodied in the highest forms the lingering traditions of the Maestri Comaschi, or Freemasons of Como, from whose genius many of the most celebrated buildings of the middle ages derived their highest graces of ornament. Of all the Lombard cinque-centists, however, the greatest admiration must be reserved for Agostino Busti, better known as Bambaja, and his pupil Brambilla, whose exquisite works in arabesque at the Certosa must ever remain marvels of execution.

At Venice, the first great names which call for notice are those of the Lombardi, who adorned the city with some of its chief monuments. It may serve as a landmark to note that the Church of the Miracoli with its perfect cinque-cento work was finished in 1489. They were followed by Riccio, Bernardo and Dominico di Mantua and other lesser architects and sculptors, all whose glories were however eclipsed by the great Jacopo Tatti (Sansovino). At Lucca, Matteo Civitale (1435-1501) fully maintained the reputation of the period. It may be well to note here that almost every individual of the above-named practised architecture, as well as sculpture, and occasionally painting.

Returning to Tuscany, we find towards the close of the fifteenth century, the utmost perfection of Renaissance Architecture combined with ornamental sculpture. The names of Mino da Fiesole—the greatest of the celebrated School of the Fiesolani—Pollaiuolo—Benedetto da Maiano, and Bernardo Rossellini, bring to mind the exquisite monuments which abound in the Churches of Florence and other towns of the Grand Duchy. These artists excelled alike in wood, in metal, in stone, and in marble, and their works have only been surpassed by those of Andrea Contucci or Andrea del Monte Sansovino, whose sculptures at Orvieto, &c., and monuments in Santa Maria del Popolo at Rome, leave nothing to be imagined more perfect. Amongst the shining lights whose rays spread furthest towards the close of the fifteenth centuary, should certainly not be omitted the truly elegant writer, refined critic, and masculine architect, Leo Batista Alberti (born 1398, died 1472), whose great work "de re ædificatoriâ" was the first systematic treatise on our art since the days of Vitruvius and the great prototype of all the best essays which have been written since his days. From having been published in Latin its influence was not limited to Italy, but spread the views of its author, and his classical as well as practical instruction, far and wide over the continent of Europe towards the close of the fifteenth century.

During the first few years of the sixteenth century, the influence of the great Italian school of art manifested itself strongly in Germany in the persons of men such as Albert Durer, Peter Vischer, and Jean de Mabuse, but in England scarcely at all; excepting by transmission through the entry of the last named into the service of Henry VII.

Mr. Wornum who has made it a labour of love to test the correctness of all the usually received dates which serve as land-marks in the chronology of art-History, has stated it as his opinion that this fine artist, indifferently known as Jan de M'Abuse, Jan Gossaert, and Johannes Malbodius, was born about 1470—visited this country in 1498 or 99, and died in 1532. To him we shall return almost immediately. I have already alluded to the fusion of the practice of various branches of fine arts by the leading foreign artists of the close of the fifteenth, and commencement of the sixteenth centuries, and I would now especially point attention to it as the transcendent quality which fitted the pioneers of the revival of art for the task of reformers. In two notable cases this quality extended itself into the form of all but universality. In the persons of Leonardo da Vinci and Albert Durer, the same habits of profound philosophic inquiry, combined with the utmost appreciation of mechanical dexterity existed, and induced their record of studies in every direction. In the notebooks of the former preserved at Paris and Milan, and in those of the latter in the British Museum, ample evidence is preserved of the parallel ardour with which these master-minds devoted themselves to the study of geometry, engineering both civil and military, practical architecture (Albert Durer's studies of wooden roofs are peculiarly interesting), human and comparative anatomy, physiology, and the science of the laws of proportion, balance and movement in all things capable either of setting themselves in motion, or of being set in motion by others. Not only their private note-books, but their published works tell the same tale. To the attention of the architectural student I would especially commend Albert Durer's "Underweysung der messung mit dem Zirckel und Richtscheyt," (Nurg. 1525), and his "Etliche Underricht zu Befestigung der stett, Schlosz und flecken," a very important essay on fortification, containing amongst other matters, a lively prototype of the circular system which has been so warmly advocated by our distinguished fellow, Mr. Fergusson. It is by no means foreign to our special subject to observe the skill attained by such great artists in the science of attack and defence, as expounded in the admirably illustrated works of Valturius and Vegetius, the text-books of the great Condottieri of the sixteenth century; since we shall find that one of the most skilful Italian painters who ever worked in this country. died in the service of Henry VIII., in the exercise of his duties as "magister tormentorum," or devisor of implements of war. Vasari's pleasant chapter on the "diversi artifici Fiamminghi," traces the spread of

Italian art in Flanders, and commemorates the leaders of that school, specimens of which were early brought into this country by means of the renowned Corporation of the Merchants of the Stahlhof or Steleyard, to whom such important privileges were granted by Henry VII.; and who were as ready to protect and support Flemish artists visiting England, as the Pelavicinis Bardis and other great Lombard Merchants settled in London were to assist and introduce Italians of adequate ability.

Having now traced firstly England's need of skilled artists and artizans at the close of the fifteenth century, and secondly, the abundance of contemporary art-talent in Italy, Germany, and Flanders, we proceed to trace the missionaries who were induced to visit us, and propagate the doctrines and practice of the art of the Renaissance, destined to supersede the waning traditions of our once admirable school of mediæval art.

Walpole, in his anecdotes assures us that two painters only are mentioned in the reign of Henry VII. A bald statement is preserved in the registrar's office at Wells, that one, Holbein, lived and died here in the reign of Henry VII. He was probably a limner, and can scarcely have been a relative of the great Holbein of the succeeding reign. The other painter was the Jean Gossaert, born at Maubeuge in Hainault, and hence known as Maubeugius or Mabusius or Mabuse, to whom allusion has been already made. By education and talent he was well fitted to set a new fashion in England, since Vasari tells us that "Giovanni di Mabuse fu quasi il primo che portasse d'Italia in Fiandra il vero modo di fare storie piene "di figure ignude e di poesie." His talents and industry were great, in spite of his dissipated habits. The anecdote is told of him that when given a suit of damask by the Marquis de Veren, in which to appear before Charles V., he sold the cloth, and made himself a suit of paper, which passed muster even with the emperor for the genuine article. He painted the celebrated Adam and Eve, which being hung at Whitehall, gave its name to the gallery. In Walpole's time this picture was in the King's antechamber at St. James's, and subsequently at Windsor. Walpole has engraved an interior of a church with some figures he regards as intended to represent the king's children Henry and Elizabeth.

The well known picture of three children, generally supposed to pourtray the family of Henry VII. in the royal collection at Windsor, of which replicas attributed to Holbein, exist in the Wilton and other collections, has been lately identified on good grounds by Mr. G. Scharf,* as the original picture referred to in Henry the VIII's catalogue as "item a table, with the pictures of the three children of the Kynge of "Denmarke, with a curtayne of white and yellow sarcenett paned together," and in that of King Charles I. as "item a Whitehall piece, curiously painted by Mabusius, wherein two men-children and one woman-"child playing with some orange in their hands, by a green table; little half-length figures upon a "board in a wooden frame."

The best evidence however that we possess in this country of the rare talents of Mabuse, consists in the grand picture at Castle Howard, which some of my hearers may remember to have seen when exhibited in London at the British Institution. This is certainly one of the most masterly pictures of the early Netherlandish school in existence. It was originally painted for the Abbey of Grammont, and represents the worship of the Magi. It is rich in ornamental and quasi-architectural accessories, and although painted apparently before the visit to Italy, which made him what Vasari and Sandrart† have described him, the artist had evidently emancipated himself from Gothic trammels, and had begun to emulate the change of manner effected by his honoured friends and rivals, Lucas Van Leyden and Albert Durer. Van Mander, who is the best authority, as the earliest biographer of Flemish artists, records only the fact of Mabuse's visit to this country, and we are left altogether in the dark as to the duration of his visit, and the extent of influence exercised by him upon English art. All we can do is to esteem him as the precursor of the impending change, which only assumed a definite shape in the early years of the reign of Henry VIII., which I need scarcely remind you commenced in the year 1509, at which date the handsome and accomplished heir to Henry VII's vast accumulated wealth had only attained his eighteenth year.

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* See his "Remarks on some portraits from Windsor Castle, Hampton Court, and Wilton House."—Archæologia Vol. XXXIX, p. 245.

† Sandrart follows Vasari's very words in declaring that Mabuse was one of the first "historien voll nackender "bilder zu machen, und allerley Poetereyen darin zu setszen."

The proficiency of Henry VIII. at the period of his accession to the throne, in both reading, writing, and speaking Latin, French, and Italian, is testified by the foreign ambassadors who then visited at his court; and for a measure at least of this proficiency he was obviously indebted to the learned Frenchman Giles du Vadis or "Ægidius Dewes," who was employed as royal librarian by Henry VIII., as he had been in his youth by his father. Dewes died in 1535, having instructed all the royal family in his native language. At Henry's command he wrote "an Introductorie for to learn to rede, to pronounce, and to speak French truly, compyled for the princess Mary." Thus was Henry specially qualified to hold personal intercourse with the foreigners in whose society he rejoiced to exhibit his magnificence and rare personal accomplishments. The king and his first great minister met as upon a common ground in their love of display, no less than in their love of learning, and in their desire to raise Englishmen to at least a level with the natives of those countries, with whose advanced civilization and cultivation of the arts of luxury and delight of every kind they actively sympathised. They vied as it were in giving encouragement alike to literature and art. To induce the most learned professors to visit this country for the purpose of raising the standard of classical education, or to take into their service foreign artists capable of re-creating the outward forms of classical art, were to both objects of almost equal emulation.

The following in addition to Mabuse, appear to have been, as far as I have been able to trace them the principal foreign artists and artificers employed in England during the XVIth century, in an approximation to chronological sequence, and in the order in which I propose now to far too briefly notice their lives and works; dwelling (as is fitting to an architectural audience) upon those who exercised a direct influence upon architecture, and passing rapidly over those who practised as painters only.

1. Torrigiano.
2. John Maynard, or Meinert.
3. Benedetto da Rovezzano.
4. Antonio Cavallari.
5. Vincent, or Vincenzo, Volpe.
6. Anthony, or Antonio, Toto dell Nunciata.
7. Bartholomew, or Bartolomeo Penne.
8. Lucas Cornelii.
9. Nicholas Modena, or Nicola da Modena.
10. Ambrose, painter to the Queen of Navarre.
11. Theodore Bernardi.
12. Antony Bernardi.
13. Lambert Bernardi.
14. Ellis, or Alice Carmillion, "millyner," otherwise, probably Elisa Carmillione, Milanesa.
15. Girolamo da Trevizi.
16. Gerard Horneband.
17. Luke Horneband.
18. Susanna Horneband.
19. Lavinia Terninck.
20. Katharine Maynors, of Antwerp.
21. Harry Maynert, painter, one of the witnesses to Holbein's will, 1543.
22. Hans Holbein.
23. Anthony Snecher, armourer.
24. John of Anwarpe, or Antwerp, goldsmith.
25. Jan Mustyan, born at Enguien, arras maker.
26. John de Mayne, seal engraver.
27. Richard Atsyll, stone engraver.
28. John of Padua.
29. Johannus Corvus Flandrus.
30. Gervas Flick, Gerberius Fleccius, Fliccus, or Flicciis "Germanus."
31. Guilim Stretes.
32. Sir Antonio Moore.
33. Joost van Cleef (Zotte).

34. Nicholas Lyzarde, or Nicolo Lizardi, d. 1570.
35. Lucas de Heere, b. 1534, d. 1584.
36. Frederico Zucchero, b. 1543, d. 1609.
37. Cornelius Ketel, b. 1548, d. 1604.
38. Mark Garrard, b. 1561, d. 1635.
39. Henry Cornelius Vroom, b. 1566, d. 1640.
40. Petruccio Ubaldini, worked in London, 1565.
41. George Hoefnagel.

It appears that Henry VIII busied himself in the first year of his reign with the collection of information as to the probable cost of the Royal monument projected by his father, and as to the most fitting persons to execute it. A memorandum of this nature docketted in the king's own hand, exists in the Record Office, and has been printed in Mr. Brewer's most interesting Calendar. It contains various estimates made by different artificers, all apparently Englishmen, excepting John Maynard the painter, whose real name seems to have been Hans Meinert. Most of the persons whose names are mentioned in this memorandum were subsequently employed, with the notable addition of the eminent foreigner to whom we shall presently refer, and to whom probably the design of the whole is due, as well as the execution of the really artistic portions. Meritorious in their way as several of these English art-workmen may have been, it was but natural that the king should seek to employ for the effigy at least of his father, some one of the great artists of Italy, whose fame had spread throughout Europe; and samples of whose rare talents had been no doubt brought to this country by the rich Lombard merchants, and by the Venetians, whose interest it was at the commencement of his reign to conciliate the king's favour, which they could do in no more graceful way than by anticipating his artistic necessities. I have already alluded to Henry's accomplishments as a linguist, which no doubt facilitated his acquisition of foreign tastes—another of his natural endowments, his love of and ear for music—should also be noted as a special bond of sympathy between himself and his cultivated Italian cotemporaries. Henry's own gifts as a musician were of no mean order, and his protection of everything connected with music was most liberal. In the letter of Nicolo Sagudino, Secretary to the Venetian Embassy, dated June 6th, 1515, to one of the Foscari, an excellent description is given of the magnificent entertainment given to the ambassadors at Greenwich. After the banquet, "they were taken into rooms containing a number " of organs, harpsichords (*clavicimbani*), flutes, and other musical instruments, where the prelates and " nobles were assembled to see the jousts then in preparation. The ambassadors told some of these " grandees that he (Sagudino) was a proficient on some of these instruments. He was consequently " asked to play, and did so for a long time, being listened to with great attention. Among the listeners " was a Brescian, to whom the king gives 300 ducats a year for playing the lute, and who took up his " instrument and played a few things with him (Sagudino). Afterwards two musicians also in the " king's service (it is to be hoped they were not Englishmen), played the organ, but very badly; they " kept bad time, their touch was feeble, and their execution not very good. The prelates who were " present said the king would certainly desire to hear him, as his majesty practises on these instruments " day and night."* In another passage of his letter, Sagudino askes for new music from Venice, especially some compositions of Zuane (or Giovanni) Maria's, to exchange for some of the English, and especially for a few new "ballata," or music for state entries and dances.

This appears to have led to the introduction to court of many eminent Italian musicians, for a Venetian organist, Dionysio Memo, speedily took the place of the performers condemned by Sagudino, and in 1517, we find him presenting to the king so excellent a performer on the lute, "that his majesty " never wearied of listening to him, to the despair of another Venetian, Zuan Piero, who thereon " determined on returning to Italy." Two years later, mention is made of John Saverneac, of France,

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* Rawdon Brown's Calendar of Venetian State Papers, vol. II, page 248

"using to play upon our rebece," whose wages were 16d. per day.* Matthew de Weldre (no doubt of Gueldres), was another of the foreign "minstrelles," as was Claude Bourgeois.

The king's early marriage with Catherine of Arragon, may be regarded as another predisposing cause tending to induce Henry to look abroad for the highest class of artistic talent. That he was fortunate in the first great master upon whom he lighted, is proved by the rare merits of the works of Pietro Torrigiano, which we are still fortunate enough to reckon amongst our national art-treasures.

This distinguished artist, who was born at Florence in 1470, was taken whilst a youth into the academy founded by Lorenzo di Medici the elder, and directed by Bertholdo, a pupil of Donatello. Among the students were Buonarotti, Rustici, Granacci, Niccolo di Domenico Sazzi, Lorenzo da Credi, and Giuliano Bugiardini, all Florentines; and Baccio da Monte Lupo, Andrea Contucci, of Monte San-Sovino, and other strangers. It was whilst they were fellow-students here that Torrigiano broke Buonarotti's nose with a stone. Torrigiano described to Cellini how it happened, and we are told in the autobiography of the latter that Torrigiano and Michael Angelo were copying Masaccio's frescoes at the Church of the Carmine together, and that the latter so bantered and tormented the former that, unable to endure it, he gave him a violent blow on the nose, which he would bear the mark of to the day of his death. Vasari says, however, that Torrigiano hated Michael Angelo, and was constantly seeking to injure him, because Michael was superior to him. Whether that was the case or not, Lorenzo di Medici was so incensed against Torrigiano that, if he had not fled from Florence, he would have been heavily punished. The Pope Alexander VI. employed him, on his arrival in Rome, on the stucco-work of that part of the Vatican called the Torre Borgia; but being attracted by the pay and spoil of the soldiers under the Duke of Valentinois (the Pope's son), then in the Romagna, Torrigiano gave up his work, joined the army, and comported himself bravely. He then followed Paolo Vitelli in the war against Pisa, and was with Piero di Medici at the action on the Garigliano, where he obtained a pair of colours and the reputation of a brave ensign. Disappointed, however, in gaining the grade of captain, he returned to his art, and prepared various small figures in bronze and marble, which he sold to Florentine merchants, together with numerous drawings, all of which Vasari praises for "good manner" and great boldness of execution. The merchants above mentioned invited Torrigiano to proceed to England, where, Vasari tells us, and we shall presently see, that he executed many works. "And now," says his biographer, "did Torrigiano receive so many rewards and was so largely remunerated that, had he not "been a most violent, reckless, and ill-conducted person, he might there have lived a life of ease, and "brought his days to a quiet close." We have no knowledge of his reckless or violent conduct in England, nor in Art is it probable that he had a rival; still he left England for Spain, after having executed the monument to Henry VII. In Spain he executed various works, and gained great reputation; but, quarrelling with the Duke d'Arcos, to whom he had sold a statue of the Virgin, he broke it to pieces with a hammer. This want of reverence, either for what was "sin pecado concebida," or, for what was almost equally venerated in Spain, a "grandee," and perhaps his long stay in apostate England, induced the Inquisition to arrest and imprison him; in the prisons of which anti-reforming institution, at Seville, through indignation and grief, he is averred to have starved himself to death, in 1522, but in which it is more probable he suffered that fate which the nature of his accusers would indicate as probable. Over the door of the Sala Capitular, Granada, is a "Charity," by Torrigiano, executed as a sample of his talent, when he was at Granada, competing for "The Sepulchre of the Catholic Sovereigns," which was finally executed by Peralta, of Genoa.

I have not interrupted this hasty narrative of Torrigiano's chequered life by dwelling specially upon the circumstances of his engagements and works in this country, but as that is what primarily interests us, I proceed to allude to them now. Vasari tells us that Pietro made little figures of marble and bronze for certain Florentine merchants, by whom it is highly probable that some specimens of his handicraft were forwarded to the branches of their firm settled at London. Amongst such merchants the great firm of the "Bardi" stands conspicuous; and the entry found by Vertue amongst the records of the Court of Requests, of a cause tried in 1518 before the Council at the Palace of Greenwich, and in which the great sculptor appeared as one of the witnesses, is interesting, as identifying the connection which existed between him and Pietro di Bardi and Bernardo Cavalcanti, between whom rested the cause of strife. Vasari's words as to the fact that Torrigiano was not only invited, but brought (condotto) to this country by the Florentine merchants for whom he had worked at Florence, are precise; nor can we doubt that he was hired for the express object of executing works for the King, since he began to work for him immediately upon his arrival in this country (in 1515 probably), and one work only of his is extant in this country which was not executed, either directly or indirectly, for the Crown. Where, alas! are the "infinite cose di marmo, di bronzo, e di legno" which Vasari tells us he wrought while in the service of "that King," in competition with natives of this country, "to all of whom he was superior"?

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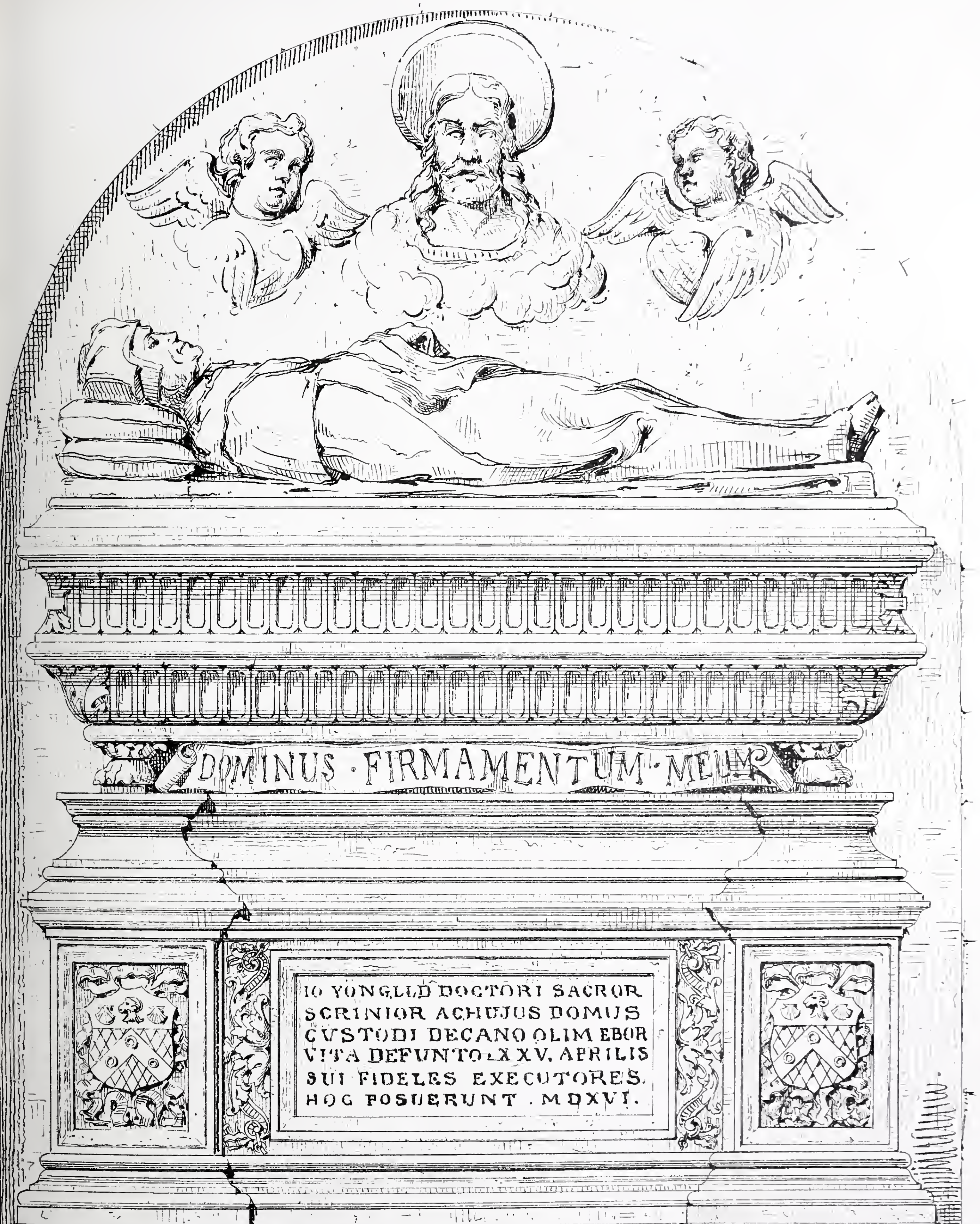
* Brewer's Calendar vol. I page cxi.

The original agreement into which he entered for the execution of the monument to King Henry VII. and his Queen with the executors of that monarch is given at full length in Ackermann's "Westminster Abbey" (vol. ii. pp. 140 to 143). It bears date A.D. 1516, and is a most interesting document. He must have worked with rare diligence, for Stowe tells us that the tomb was finished in 1519. To describe such a monument here would of course be superfluous. All must alike have recognised how entirely unlike it must have been to anything done in this country before its erection. It struck, as it were, a key-note of an absolutely fresh pitch, and produced a "great sensation" far and wide upon all who saw or heard of its grandeur. I am happy to have been able to procure an excellent cast from it for the Crystal Palace, in which, from the models having been gilt, as the original was, and from its being freed from the fine Gothic screen which surrounds the original, the merits of Torrigiano's work may perhaps be even better studied than in the original. To bring the details as to architectural style under the reader's notice, I reproduce Cottingham's view of one end of this monument. His success in this work led to the same artist's employment to execute the monument to Margaret Countess of Richmond, the mother of Henry VII., the great foundress of, and benefactress to, several of our collegiate institutions. To me, I must confess, this effigy in bronze has always appeared superior to those of either Henry VII. or Elizabeth of York. I am obliged, therefore, to differ altogether from Dr. Waagen, who, strangely enough, remarks that it is "so far of inferior merit, as that the head and hands were merely casts from "moulds taken from nature." That the artist may have been assisted by such casts is possible, but, to those who know well what post-mortem casts look like, the difference between the heavenly resignation and sentiment of the Countess's head and hands and the rigidity of expression never wanting in casts taken from corpses must be at once apparent. The very perfection of style with which the bronze is wrought, its surface, and the beautiful modelling of the drapery might, I think, have redeemed Torrigiano from such an insinuation.

The one other monument we still possess, either from the hand of Torrigiano or from that of Benedetto da Rovezzano, but most likely the former, too little known for its rare merit, is in terra-cotta, coloured most tastefully and skilfully. It is in the chapel of the Rolls Court, in Chancery Lane, and commemorates Dr. John Young, Master of the Rolls in the reign of Henry VIII. He lies, supine, with crossed hands, and wears a most dignified expression on his countenance, which is modelled in masterly style. In a recess above his effigy is a head of Christ, in the centre, and on each side an



M. DIGBY · WYATT. MENST ET DELT.

OWEN. W. DAVIS. LITH.

MONUMENT BY TORIGIANO TO DR JOHN YOUNG
IN THE ROLLS CHAPEL.

SCALE. 1 INCH = 1 FOOT.

[illegible]

angel's head in high relief. Even in Italy I know no finer coloured terra-cotta head than that of the Christ. The architectural members of the monument are of the purest cinque-cento, and, on the whole, the monument to Dr. John Young is one of the finest objects of Renaissance Art in the world. Would it were more seen. I naturally endeavoured to get casts, so as to reproduce it in fac-simile at Sydenham, but am bound to admit the reasonableness of the pleas upon which the then Master of the Rolls rested his unwillingness to grant my prayer. At Strawberry Hill was a model in stone of the head of Henry VII. in the agony of death. It is in the great style of Raphael and Michael Angelo, and worthy of either. It may fairly be assumed to have been a study executed by Torrigiano to show his capacity for executing the work—his trial-piece, in fact. It is engraved in Carter's "Ancient Painting and Sculpture." The question has occasionally been asked whether Torrigiano had anything to do with the stone statues in Henry VIIth's Chapel at Westminster. No one can, I think, believe that he had. We are indeed told that Robert Vertue, Robert Jennings, and John Lebons were the master masons, and they were very probably some of those "maestri di quel paese," alluded to by Vasari, to whom Torrigiano "showed himself so superior."

That the King was pleased with Torrigiano's work is proved by the fact of his going so far as to sanction the preparation of a draft agreement with Torysany, as he is called, for the erection of a monument to himself and Queen Catherine, at a cost of £2,000. This draft agreement, dated in 1518, was found in the Chapter House at Westminster, amongst the papers of Cardinal Wolsey, and has been printed in the "Archaiologia" (vol. xvi. p. 84). Why this agreement was never carried out does not appear, but, since both Vasari and Cellini agree in describing Torrigiano as a proud, passionate, intractable and foolish man, as well as a capital artist, it is probable that the fault was his own, and that he quarrelled with those "bestie di quelli Inglesi," as he never wearied of describing our countrymen to Cellini. Torrigiano visited Florence just about the date of this draft, for the purpose of engaging assistance for this very work; for Benvenuto, in his life, says that Torrigiano expressly told him that he had to execute a great work, "al mio Re," consisting of, or at any rate involving, grand "opere di bronzo." Cellini did not like Torrigiano's manners, and declined to go to England with him, which perhaps helped to disgust the former with his commission; any how, the affair went off.

The only foreigner who appears to have worked with Torrigiano was the painter John Maynard, or Meinert, of whom little is known save that he was so employed, and that he was probably a relative of a certain Harry Maynert, painter, "of Antwerp," who appears as one of the witnesses to Holbein's will.

This, however, was but an accidental circumstance, for Henry's taste for foreign fashions was carried into every branch of his establishment, from his serjeant-painters, architects, sculptors, and masters of engineering and music to his cooks and grooms. Thus, in 1520, we note, from Professor Brewer's Calendar,* that the King had in his service a French cook named Pirro (Pierrot), and a second horse-keeper, Ambrose de Millain (Milan): the quarter's wages of each being 66 sgs. and 8d.,—just double, as a writer in the 'Athenæum' remarks, those of the Princess's gentlewomen.

Gerard van Arcle was the King's "Plumassier," John à Gueldres his smith. Leonardo Frescobaldo and Antonio Cavallari purveyors of gold and silver cloths, were nominated in 1516 to pensions for life of £ 20. Nicholas Cratzer was the royal astronomer, and Stefano Tosso was the King's tumbler, pensioned in the same year at £ 12. 3s. 4d. for life. Pynson, the immortal printer, a native of Normandy, in the same year only gets £ 4.

The example set by the King was followed more or less by all his Court; and French and Italian fashions and examples were accepted as the only tolerable models of taste. Travelling was incessant, and students from England swarmed in the great Italian Universities of Padua and Bologna. Much as the King was enamoured of foreign ways, arts, and music, he was exceedingly touchy if any of his courtiers made invidious comparisons between those of his own and other countries. This was the source of the first disgrace of the great lover of France, Sir Nicholas Carew; who was banished for a time for exalting the French Court at the expense of the English. Other courtiers, such as Wolsey, and subsequently Cromwell, Surrey and Wyatt, Brandon, and Denny knew how to follow the King's example without offending him in this respect, however much they might incur the animosity of the old English party in the country.

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* Vol. III., p. 408.

The patronage thus afforded to foreigners of all kinds, did not fail to excite bitter jealousy and enmity on the part of the City of London; and ultimately, on the "evil May-day" of 1517, the rising took place which had for its object to cut to pieces all the strangers in London, in number from 6,000 to 7,000. The following graphic contemporary account is given in a letter (dated May 19th, 1517) from Francesco Chierogato to Vigo da Campo San Pietro: "The strangers (of whom Chierogato was one) having information of the plot, gave notice to the King, who issued threatening proclamations, notwithstanding which the apprentices maltreated many foreigners, and sacked many houses, denouncing death to the Cardinal and the City authorities. The Cardinal fortified his dwelling with cannon and troops. The King was at Richmond, and sent troops to London, who seized all the rioters they found in the streets. At length he went thither himself and routed them. . . . gibbets were raised all over the town. . . . very great vengeance was taken on them, and his Majesty showed great love and good will to the strangers."[*] This love and good will to strangers, as we shall have further occasion to note, in no wise abated in the sequel, through this vehement protest against it on the part of his "*loving* citizens upon their evil May-day." Continually at intervals during his whole reign his subjects grumbled at the King's innovations upon national traditions, as the "Prentice," in a cotemporary ballad sings:

"Poor tradesmen had small dealings then;
And who but strangers bore the bell?
Which was a grief to Englishmen,
To see them here in London dwell."[†]

There seems little doubt, indeed, that several of the celebrated seventy-eight "faults and abuses of religion" complained of in the protestation of the clergy of the Lower House, presented to Henry in 1536, derived particular "gravamen" and unction from jealousy of foreign practice. The musical novelties sanctioned by the King in his private chapel gave great offence in the Church; and but for his protection of Italian, versus English, composers and organ players, he might never have been told by his clergy that, "synging and saying of mass mattins, or evensongs, is but roryiug, howling, whistelyng, mummying, conjuryng, and jogeling; and the playing at the organys a foolish vanity."

Warned, perhaps, by the temper shown on "evil May-day," Wolsey seems to have hesitated about entrusting the design of his palaces at Hampton Court and York Place to foreigners; and, as far as internal evidence may be trusted, those buildings would appear to have been based altogether on English models. Hangings and furniture he purchased largely on the Continent, and thereby tended to introduce new types of ornament and art-manufactures into this country, which of course re-acted upon the style of national architecture. The only decided evidence of Italian art of the sixteenth century Hampton Court still shows, consists in the terra cotta roundels, with busts of Hadrian and Trajan built into the towers of the eastern gateway of Wolsey's first Court, and others of the same kind in the adjoining Court. These have been attributed to Luca della Robbia, and are said by Mr. Cole (Felix Summerley) to have been given to the Cardinal by Leo X. As they are by no means like della Robbia's work, I doubt the first assertion, and I am inclined to doubt the second, partly because Leo X. was no great patron of della Robbia's, partly because as gifts they would be scarcely valuable enough, and partly because other similar roundels and terra cottas exist in contemporary buildings in this country, as, notably, in the courtyard of St. Donat's Castle, Glamorganshire, one of which I engrave. Of those which once abounded in this country in Henry VIII.'s possession, and have perished, we are fortunately provided with sufficiently detailed descriptions to enable us to form a good idea of their general character.

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[*] Calendar of Venetian State Papers, Record Commission, vol. II., p. 385.

[†] 'Songs of the London Prentices and Trades.' Percy Society's Publications, vol. I., p. 18.

We are indebted to Mr. Wornum for having printed, in the Appendix to his excellent "account of the life and works of Hans Holbein," copious extracts from the inventory of art "properties" preserved in the Palace of Whitehall, in the year 1547. Other extracts had been printed previously by Mr. Cole, Mr. Waring, &c. Amongst those entries are many which illustrate the general state of such contemporary Art—as that patronised by the Cardinal at Hampton Court and elsewhere—very curiously. In the first place, there is to be noted the fact that what are called "pictures" appear to be bas-reliefs coloured, and more or less gilt, and made either of "erthe," *i. e.*, majolica (as the roundels), or of black "towche," or touch stone. In the second place, what we now call pictures are all called "tables;" and this title is adopted whether the "table" be an ordinary painting on wood or canvas, an alto relievo in alabaster or wood, a hanging in needlework, a plâque in enamel, a slab of marqueterie, or a specimen of glass painting. The subjects of the "tables" are, with few exceptions, either portraits or ecclesiastical and devotional themes. In one or two instances only do "histories," taken from Ovid and other authors so popular with the masters of the early Italian Renaissance, make their appearance; and even in those rare instances they seem scarcely yet naturalised and at their ease, as witness the "stained cloth with Phœbus riding *in his cart* in the air with th' history of him." Some of the pictures "made of erthe," may very probably have been the productions of Italians either in the King's or in his Minister's employ, as they certainly executed such works in their own country, and there is no reason why they should not have done so here also.

It was in his noble palaces of York Place and Hampton Court, furnished with all the sumptuous hangings and adornments which he never seemed tired of seeking for abroad, that the great Cardinal kept the high state and magnificence described by Cavendish, which was admired of all foreigners, and was even more royal than that maintained by his proud master. Thus sings old Skelton:

"The Kynge's Courte
Should have the excellence;
But Hampton Court
Hath the pre-emynence:
And Yorke's Place,
With my Lorde's grace,
To whose magnifycence
Is all the conflewence."

Probably Benedetto da Rovezzano and other Italians in Wolsey's service contributed to produce this stately "magnifycence," which was so well understood and methodised in Italy through men like Bernardo Castiglione, author of the "Cortigiano," and was maintained with great punctilio in the Court of Rome; which was no doubt the great model followed by one, the "ultima Thule" of whose ambition was to occupy the chair of St. Peter.

In the pages of Vasari is to be found the biography of the eminent artist last mentioned, and it is unnecessary, therefore, to do more here than note that Rovezzano's works at Florence, executed before he was tempted to enter the Cardinal's service, had earned for him a first-rate reputation. Those works combined Architecture and Sculpture; and prominently amongst them are to be remembered the chapel and shrine for the relics of San Giovanni Gualberto, proposed to be attached to the church of Santa Trinita at Florence. The chapel which was added to St. George's Chapel at Windsor by the Cardinal, I need scarcely remind you, was intended to contain his tomb and monument, and it was to execute this work that Benedetto da Rovezzano was specially retained. He was assisted by Antonio Cavallari, and probably other foreigners; and worked, as we are told by Lord Herbert, from about 1524 to 1529. "The design whereof (he adds) was so glorious, that it exceeded far that of Henry VII." After spending 4,250 ducats upon it, the Cardinal fell under the displeasure of the King, who, seizing upon his subject's palaces and other property, left him not even the poor "simulacra" he had destined to commemorate his unprecedented grandeur.

After the Cardinal's fall, he wrote from York, asking the King to let him have his own figure for his tomb at York, with "such parts of his tomb as shall please the King." He also beseeched the King to send Anthony Cavallari, the gilder of the tomb, back to Antwerp, and to permit "Benedict the carver" to return to Italy. The King did neither, but used up the materials for his own tomb.

The services of Rovezzano were transferred from the Cardinal to the King, who endeavoured to adapt much of the work which had been done for Wolsey, for his own monument. This, according to Nicholas Charles (Lancaster Herald), who left behind him the manuscript description of "The manner of the Tombe to be made for the King's Grace at Windsor," printed in Speed's 'History of Britain' (p. 1083), was to be mainly of copper gilt. Upon two separate altars, or table tombs of touch stone, the figures of Henry VIII. and his Queen, Jane Seymour, were intended to lie recumbent in their royal habits, "not as death but as sleeping," and of the size of a man and woman, with two angels at the head of each. "Upon a high basement between them, upon which shall be the history of St. George embossed, shall stand the King on horseback in full armour, of the stature of a goodly man, and a large horse. Over all, the Image of God the Father holding the King's soul in his left hand, and his right hand extended in the act of benediction. Thirteen prophets and four saints, all five feet high, and between each pillars of serpentine marble. The amount of the carvings—133 statues, and 44 stories, or bas-reliefs." Dallaway observes that: "In Henry VIII.'s will (dated 1546) this tomb is specified as 'an honourable tomb for our bones to rest in, which is well onward, and almost made therefore, already.'" Had but the King's successors completed what was "so well onward," England might have now to boast a Royal Monument, before which those of the Abbaye of St. Denis might "pale their ineffectual fires." The bulk of what was done must have been very great, since the metal melted down and sold by the Parliament Commissioners fetched £600. I am inclined to fancy it possible that the beautiful statuette of St. George and the Dragon belonging to Mr. Louis Huth, which I have engraved, may have been a study for an equestrian group for this monument, superseded by the equestrian statue of Henry, above described.

Poor Benedetto's eyes were injured by working in the King's foundry, and he at length returned home rich; but doomed speedily to lose vision altogether (in 1550), and to die shortly afterwards. Of his fellow-workman, Cavallari, we lose sight after the period of Wolsey's disgrace.

For a notice of the next artist upon our list, Vincent or Vincenzo Volpe, I am indebted to Mr. Gough Nicholl's admirable essay "On the Contemporaries and Successors of Holbein," printed in the 39th volume of the 'Archæologia.' After giving extracts from records proving Volpe's employment by the King in various branches of decorative painting, from 1514 to 1530, Mr. Nicholl adds:

"I think it by no means improbable that Vincent Volpe may have been the painter of some of those curious military pictures, something between plans and bird's-eye views, that are still to be seen on the walls of Hampton Court. That he was an eminent artist, is proved by the fact of his receiving wages equal to two-thirds of those paid to Holbein. Volpe is one of the very few eminent foreigners of this period who seem to have escaped the notice of Virtue, Walpole, and Dallaway, to whom Englishmen have reason to feel deeply indebted for the preservation of so much relating to the history of Art in this country, in every way worthy to be had in remembrance.

We now come to an artist of much greater importance than Volpe, the excellent Florentine painter and architect, Anthonio, or Toto, dell Nunziata, in his youth, a pupil of Ghirlandaio's, and a formidable rival ("uno sprone che del continuo lo pugneva") to the all-accomplished Perino dell Vaga. In him we at length meet with an artist gifted with special talent for Architecture. He, like Torrigiano, and probably most of the other Italians who entered the service of the King, "was taken ('condotto') to England by some of the Florentine merchants." There (says Vasari), in his 'Life of Perino dell' Vaga,' Toto executed all his works, "and by the king of that *province* for whom he wrought in architecture (as well as in sculpture and painting), and for whom he built his principal palace, was most handsomely rewarded." The credit is due to my friend the late Mr. Carpenter, of the British Museum, of having been the first to notice this passage and identify Toto with the design of Nonsuch. Not only was Nonsuch the principal palace built by Henry, but it was the only one he can be really said to have built; and it was, moreover, so different from all other palaces, in England at least, as to have fairly earned its cognomen. Toto's earliest education had specially fitted him for dealing with such an infinity of allegorical and quasi-pictorial sculpture as that with which we shall find Nonsuch to have been adorned; since his father, in whose "bottega" he was first brought up, obtained his nickname of "Nunziata" from his annually furnishing all the quantity of imagery with which the feast of the Annunciation was wont to be set forth in a tangible shape at Florence. From Mr. Gough Nicholls, who wrote a capital notice of Nonsuch in the 'Gentleman's Magazine' in August 1837, I borrow the following notice of the edifice:

"The original and principal structure was of two stories, the lower being of substantial and well-wrought freestone, and the upper of wood 'richly adorned and set forth, and garnished with a variety of statues, pictures (*i. e.* coloured figures in relief), and other artistic forms of excellent art and workmanship, and of no small cost.' * Its roof was covered with blue slate. In the centre, over the gatehouse to the inner court, was a clock turret, and at either end of the structure, east and west, was a large tower of five stories high commanding an extensive prospect. This singular building remained in good condition for more than a century; for it is noticed both by Evelyn and Pepys, in their diaries in the year 1665, when it was temporarily occupied by the office of the Exchequer during the prevalence of the plague in London. 'I took (says Evelyn) an exact view of the plaster statues and bas-relievos inserted 'twixt the timbers and punchions of the outside walls of the court, which must needs have been the work of some celebrated Italian. I much admired how it lasted so well and intire since the time of Henry VIII., exposed as they are to the air, and pity it is they are not taken out and preserved in some dry place, a gallery would become them. There are some mezzo-relievos as big as the life. The story is of the heathen gods, emblems, compartments, &c. The palace consists of two courts, of which the first is of stone, castle-like (built in the reign of Elizabeth), by the Lord Lumley; the other of timber, a gothic fabric, but these walls incomparably beautified. I observed that the appearing timber punchions, entrelices, &c., were all so covered with scales of slate, that it seemed carved in the wood and painted, the slate fastened on the timbers in pretty figures, that has, like a coat of armour, preserved it from rotting. There stand in the garden two handsome stone pyramids.' Pepys describes the same features as 'figures of stories and good painting of Rubens' or Holbein's doing; and one great thing is, that most of the house is covered—I mean the posts and quarters in the walls—with lead, and gilded.'

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* Survey of the Parliamentary Commissioners in 1650.

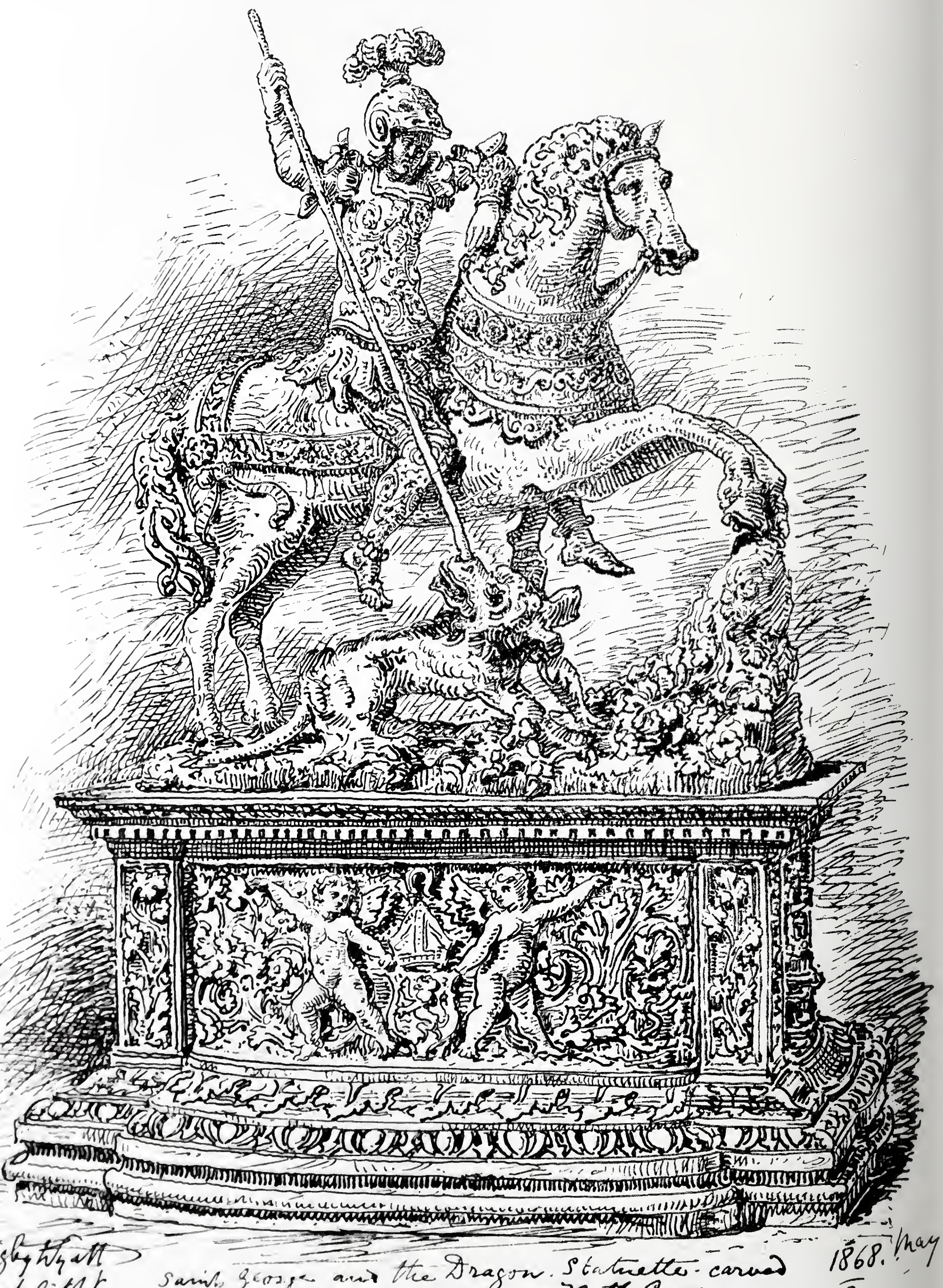
" In the earliest description of Nonesuch, that published in Braun's 'Civitates,' 1582, it is stated that Henry VIII. 'procured many excellent artificers, architects, sculptors, and statuaries, as well Italians, French, and Dutch as natives, who all applied to the ornament of this mansion the finest and most curious skill they possessed in their several arts, embellishing it within and without with magnificent statues, some of which vividly represent the antiquities of Rome and some surpass them'—terms which are echoed by Camden in his 'Britannia,' who declares that Nonesuch was 'built with so much splendor and elegance that it stands a monument of art, and you would think the whole science of architecture exhausted on this one building. It has such a profusion of animated statues and finished pieces of art, rivalling the monuments of antient Rome itself, that it justly receives and maintains its name from them.'

" Henry VIII. did not commence the erection of Nonesuch before 1538, for it was in that year that he acquired the site, previously called Cuddington. It was still unfinished at his death, and remained so during the reign of Edward VI., but in that of Mary it was completed by the Earl of Arundel, 'after the first intent and meaning of the said King his old maister,' and the front quadrangle was afterwards added by the Earl's son-in-law, Lord Lumley; from whose hands it reverted to the Crown in 1591 by exchange for other property."

Fortunately, we may form a good idea of the aspect of Nonsuch from early prints, the most important illustration being the view (a portion of which I reproduce in lithography) taken by George Hoefnagel in 1582, an impression of which is amongst the choice engravings shown in the King's Library of the British Museum. In whatever capacity Toto may have worked for the King, in the records he is always described as "paynter," and he ultimately held the appointment of "serjeant paynter." In the accounts he is always associated with "Bartilmew Penne" (Bartolomeo Penni), another Florentine, with whom, no doubt, he generally worked. Much discussion has taken place amongst the learned as to the identity of this Bartolomeo Penni with the Luca Penni, brother-in-law to Perino dell Vaga, mentioned by Vasari as having entered the service of Henry VIII. In spite of Vasari, I am inclined to believe that they were two individuals of the same family, Luca being in the service of Francis I, and Bartolomeo in that of Henry VIII. Like Inigo Jones subsequently, Toto was an ingenious designer of "masques and entries," as his father had been before him.

If Bartolomeo even were Luca, neither are to be confounded with another Luca, a painter of Leyden, who came over here with a large family, tempted by the reports of Henry's magnificence. At least so says Walpole, whose error in confusing this Lucas with Cornelius Hayes, whose name occurs in a list of new year's gifts for the thirtieth year of Henry's reign, in which mention is made of a silver cup given to Hans Holbein, made by "Cornelii," has been pointed out by Mr. Franks in the 'Archæologia,' vol. xxxix. page 8.

We now come to an artist whose ability must have been first-rate—Nicholas of Modena, generally described in the accounts as "kerver." He appears to have entered the King's service in 1537, and to have continued attached to the Court at any rate as late as the fifth of Edward VI. (1552). He made the Royal effigy (the "picture," as Machyn calls it) which surmounted the King's coffin at his death; and Mr. Nicholls has unearthed, *inter alia*, a curious description of a cotemporary work of art as "by Modeno a feire picture" (no doubt carving, the term "picture" being



M. Digby Wyatt
delt. et litht.

Saint George and the Dragon. Statuette carved
in wood. the property of Louis Huth Esqre.

1868. May

constantly used to describe basso and alto relievos), paynted of the Frenche King his hoole personage, sett in a frame of wodde.'' This entry has assisted Mr. Scharf in identifying as by Modeno the beautiful little figure of Henry VIII. standing on the capital of an Ionic column, exquisitely carved in hone stone in very high relief, which formed one of the greatest of the Strawberry Hill treasures. It is now in the possession of Mr. Dent of Sudeley Castle. In spite of its diminutive size, Mr. Scharf recognizes it as one of "the noblest representations of King Henry in existence." It once belonged to the Arundel collection and afterwards to Lady Betty Germaine; it bears, therefore, a good pedigree. From identity of style Mr. Scharf also attributes to "Modeno" a fine circular medallion of stone in high relief in the Long Gallery at Hampton Court, which has been hitherto associated with the name of Torrigiano. I cannot help thinking that the beautiful statuette of St. George and the Dragon standing on a fine cinque-cento pedestal, carved in wood and gilt and painted, in the collection of Mr. Louis Huth, which I have engraved, is by the same hand, if not by Rovezzano (see ante, page 224) or Torrigiano.

Of Ambrose, "paynter to the Queen of Navarre," I have been able only to find that on the 13th of June, 1532, he received some twenty crowns "for bringing of a picture to the King's Grace to Eltham." It is not probable that such an artist would have visited this country without desiring and receiving some employment from so liberal a patron as Henry VIII. bore the reputation of being throughout Europe; but of what nature any such employment he may have obtained was, or what status Ambrose himself occupied as an artist I have been unable to discover.

Of not much greater note appear to have been the three Bernardi—viz. Thodore the father, and Antony and Lambert his two sons. They were all brought to England in 1519 by Bishop Sherburne and employed by him on several pictures illustrating the history of the diocese of Chichester, which in a sadly repainted and mutilated form have descended to our days. Dallaway considers that the chambers in Coudray House were also painted by them; and they were probably amongst the earliest of the decorative painters whose peculiar arabesque work adorned the architecture of the Renaissance in England, and set the fashion of the rich coloured decoration subsequently followed in the great Elizabethan houses. Purity of style, however, of painted arabesque never seems to have obtained to any great extent in England. The King's notion of decorative painting seems to have been divided between heraldic insignia and fantastic "imprese" or emblems. He was particularly fond of ordering the introduction of the "Kynges bestes" and the King's or the Queen's "wordes" with "knotys" and "badgys;" and the Royal vagaries in this way frequently go far to spoil the designs even of the accomplished Holbein. He appears, nevertheless, to have kept some skilful Italian decorative painters about him; and no doubt the miniaturist Ellis, Alice, or Alye Carmylion Millyner, otherwise Elisa Carmillione Milanesa, who was in his service from 1523 to 1548, was well versed in the fine decorative style of Northern Italy and the school of Leonardo and Luini.

Girolamo da Treviso, by whom the fine altar piece representing "the Madonna and Child enthroned with Saints and Angels," in our National Gallery, was painted, and who stands next upon our list, was born at Treviso in 1497. Having failed, as it is related by Vasari, in a competition at Genoa with Perino del Vaga about 1530, he quitted his native country and entered the service of "bluff Harry," as a "magister tormentorum" or engineer. He was killed by a cannon-ball in the year 1544, at the siege of Boulogne. Henry having failed in inducing Raffaelle to visit England, had to content himself with Trevisano, who was one of the closest imitators of the great Urbinese, not in his painting only but in his architectural and decorative studies as well. His knowledge of engineering was, however, his special recommendation to the King, and led to his employment at a large salary and to his most honourable entertainment by his master, whom he delighted with "alcune prove d'edifizii ingegnosi cavati da altri in Toscana e per Italia."

But for his inopportune and early death at the age of thirty-seven only, Girolamo would probably have done more for architecture in England than any of his contemporaries who practised in this country. With him closes the list of Italians, predecessors, contemporaries and rivals of Holbein in England; and it remains for us now to trace rapidly natives of other countries who fall into the same general category. I cannot, however, but preface my notes on this portion of my theme by drawing attention to the notable deficiency of the supply of artists or art-workmen from France. One can only attribute this to the combination of several accidents—1st, the greater fame of the Italian schools; 2nd, the influence of the Italian merchants resident in London; 3rd, the old tendency of Flemings to suck the golden eggs of Britain; 4th, the rivalry of the merchants of the Steleyard with those from Italy; and 5th, the King's jealousy of Francis I. and the French.

When Holbein visited England, bringing with him his letter of introduction from Erasmus to Sir Thomas More, in probably the year 1526, he was himself but 32 years of age, King Henry VIII. being four years his senior, and having occupied the throne since 1509. At the date of his arrival, although one John Browne held the office of serjeant painter to his Majesty, the really ablest artist resident in this country appears to have been Luke Hornebolt of Ghent.* This clever painter's father, Gerard, and his sister Susanna, were both residents in England before the year 1529, and such was the talent of the lady especially, that Albert Dürer records in his diary, that when he visited her father in Antwerp in 1521:—"Item. Master Gerard the Illuminator has a little daughter about 18 years old, "named Susanna, who has illuminated a little leaf, a Saviour, for which I have given a florin. It is a "great wonder that a woman can do so much." Guicciardini† is scarcely less emphatic when he declares that so excellent was she in illumination, that the great King Henry VIII., with noble gifts and abundant provisions, enticed her to England, where she lived many years in great favour and estimation with all the Court; and there, finally, she died rich and honoured." Susanna's great rival as a miniature painter, in addition to Eliza Carmillione, already noticed, was Lavinia Teerlinck, daughter of Simon Benninck, of Antwerp, best known as Simon of Bruges. Mr. J. G. Nicholls, in his admirable essay in the 'Archaiologia,' "on the Contemporaries and Successors of Holbein," has given many interesting particulars touching this lady, and her ultimately great popularity with Queen Elizabeth, whom she painted many times, and from whom she received in return many valuable presents of gilt plate. She also was one of Henry the VIII.'s importations. We hear further of a very clever female artist in the same style, one Katherine Maynors, of Antwerp. She was, no doubt, thoroughly imbued with Holbeinism, as her brother Harry was one of his most intimate friends.

The extension of the arts of printing and engraving diverted these able female artists from their original vocation, the embellishment of manuscripts for Royal Libraries, and no doubt induced them to turn their attention to the delightful practice of miniature portrait painting. So transcendant is the merit of the finest miniatures of Henry VIII.'s time, that writers of Art have, until quite recently, been willing to attribute them to no other hand than that of the immortal Holbein himself. The important discovery in February, 1861, of that artist's will by Mr. W. H. Black,‡ and the fixture thereby of the date of his death in 1543,—eleven years earlier than the date at which it had been previously believed to have taken place,—have imposed upon cognoscenti the burden of discovering by whom the works were done, which, clearly referable to the eleven years in question, had been previously unhesitatingly ascribed to Holbein.

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* Specimens of Hornebolt's ability may be examined in the shape of twenty-one drawings of allegorical subjects added to the collection of the British Museum during last year.

† Descrittione di tutti i paesi Bassi.

‡ See the "Archaiologia," Vol. XXXIX., in which the text of the will, and Mr. Black's, Mr. Nicholl's, Mr. Frank's and Mr. Scharf's comments on the altered aspect thrown by it upon contemporary Art history are printed in extenso.

Among these are many miniatures of the highest excellence, the merit of the execution of which must now be restored to their rightful owners above enumerated—clever descendants of the great missal painters of Italy and Burgundy. The conclusion is then forced upon us, that the same hands which painted the miniatures of these eleven years must have done those which exactly correspond with them, and which must have been completed before Holbein's death. Away then melts the tradition, which was never very satisfactory, although universally accepted, that Holbein was the great founder of our National School of miniature painting, ultimately made so illustrious by the Hilliards, Olivers, and Coopers. Fortunately his reputation needs no borrowed plumes, and there is quite enough left to prove his just title to the admiration and estimation in which he ever has been and must be always revered as one of the ablest artists who ever lived. The artistic quality he possessed in the highest degree was, I consider, the intensity with which he realised "form." Able master as he was of delineation, what gives the stamp of enduring truth to his work is the feeling of assurance his delineation conveys to the mind of the spectator, that what he has drawn from life was the "vera effigies" of what he saw,—that what he designed could never be executed with equal propriety in any other way than as his drawing defined it. There is never any uncertainty as to his intention or meaning,—what he says was, was,—what he says should be, should be. In this precise conception of pure form, and power of conveying his own sense of it to others, he stood upon the same platform as the great men to whose universal genius I have already alluded—Albert Dürer and Leonardo da Vinci. The artist who possesses in a high degree any such power as that I have attempted to define, must of necessity have the requisite aptitude for success in either painting, architecture, or sculpture, or all three; since the power in question lies at the root of and is indispensable to the satisfactory practice of either or all. Architects will do well to look earnestly at such reliques as time has spared of the genius of Dürer, Da Vinci, and especially of Hans Holbein, since so far as I know they were the best makers of working drawings who ever lived. Of whatever they drew they gave every characteristic, and their slightest sketches never fail to mark essentials and to omit secondaries of form and expression. How often in architects, painters, and sculptor's studies is the reverse the case.

Happily there is no need now to dwell upon Holbein's career as a painter, for the excellence of recent memoirs of him, published both at home and abroad, leave little or nothing unillustrated on that head. His peculiar interest to *us* is his genius as a designer, and the impetus given by his example and practice in substituting fresh models of beautiful form for the feeble mannerisms into which Gothic art had sunk at the date of his arrival in this country. This took place in the year 1526, Holbein being at that time in his twenty-eighth year. He came to us from Basle, where he had been practising designing in all its branches for about ten years. The existence of many works at Basle referrible to this period induced, until comparatively recently, the not unnatural supposition that Hans Holbein was a native of that city. The only difficulty which this theory presented was the very great one of discovering from whom he could, if reared at Basle, have received the peculiar education in art which made him a great master at so early an age as from eighteen to twenty. That term may surely be applied to one who united at so early an age, in such a place as Basle, and at almost the beginning of the sixteenth century, the following qualities:—a competent knowledge of the theory and practice of drawing and painting,—an unerring eye and thoroughly trained hand,—a mastery over the rules of composition and design on the best Italian traditions,—an acquaintance with the forms and proportions of classical architecture and ornament, a thorough technical facility in applying art to industries demanding specific design, and a pliant facility which enabled him to lend himself to each conventional form of design as though that particular form had been his individual specialty. Happily the demonstration by Dr. Passavant, in 1846, that Holbein had been reared in Augsburg, from whence, at the age of about eighteen, he removed with his father to Basle, "came to the front" to solve the mystery of much which appeared inscrutable, and to account for Holbein's having acquired in early youth that universality of practice which distinguished his maturity, and which specially brings him within our notice this evening. I need scarcely remind you, that as one of the most considerable of the old imperial free cities of Germany, Augsburg shared with Nuremburg the first extension of commercial and manufacturing energy from Italy Northwards and towards the West. The princely mercantile houses of the Fuggers and the Welsers rivalled the Bardi and the Medicis in the vastness of their operations and in the encouragement they gave to art and artists. They brought to Augsburg the handicrafts as well as the products of Milan, Florence, Venice, and Genoa, and preceded the rest of Europe in disseminating the principles of the application of the types of Renaissance form to architecture and industrial art. This was the hot-bed in which the budding genius of Hans Holbein was forced, and here it was that he learnt, like the most famous contemporary Italians, how to apply his dexterity and readiness in design to every possible theme. In fresco, oil, stained-glass painting, designing for the early printers, Froben and Bebelius of Basle, Treschel of Lyons, and at a later date probably, Pynson in England, wood-blocks, title-pages, borders and alphabets (I have reproduced some specimens as illustrations to this paper), making working drawings for jewellers, metal workers, weavers, tapestry workers, wood and stone carvings, and even for masons and carpenters, he exercised himself freely during his residence at Basle, and so much to the delight of the citizens, that great efforts were made to recall him even after he had taken root in this country.

It would be beside my present object to dwell upon the circumstances of his life, his friendship with Erasmus, by whom he was introduced to Sir Thomas More—his employment by Henry VIII.—and the portraits and pictures he executed for the king and others. My aim is to recall to you the evidences we are fortunate enough to still possess of his admirable talents as a designer. First and foremost amongst such evidences, as exhibiting the wide range of his powers, must be placed the invaluable small octavo volume of designs, principally for jewellers and cutlers work, which is preserved amongst the Sloane MSS. in the British Museum. This precious little book contains as many as 182 subjects, mounted upon 29 pieces of card-board. The designs are for the most part drawn with a pen with black ink, and then some slight touches of brown have ben put on for the shadows. Most of the designs have the ground blackened, the ornaments being left in white. Some of the jewels are entirely coloured, and are often touched up with gold—several of them are designed for enamelling in high relief.

The following is a short analysis of these interesting drawings:—Nos. 1 and 5 are probably intended for portable reliquaries. They consist of two pillars with a door between them, or they may have been for gates to aumbries. Nos. 3, 4, 6, 9, 11, and a great many more are small circles, etc., containing combinations of initial letters. Nos. 8, 9, are portable reliquaries in the form of little books. They both have rings for the purpose of attaching them to the girdle, and No. 10 has the initials T.W. and W. T. possibly for *Sir Thomas Wyatt.* Nos. 16, 33, 35, 84, 91, 92, 93, 90, 95, and several others are designs for the jewel which was suspended round the neck with a ribbon or chain, which are shown in some cases. The design consists of jewels and their chatons, disposed in regular order, and connected, the interstices being filled up by foliage or scrolls. This was a very common kind of jewellery about this time. Nos. 45, 47, 41, 39, 103, 105, 100, &c., are a smaller variety of the above, and consist of only one stone and its chaton, surrounded by, and sometimes brought within a circle by means of, foliage, &c. Nos. 46, 115, 116, 117, 114, &c., were equally intended for suspension from the neck, and are initial letters interlaced, formed of metal, and jewelled in various places. Nos. 30 and 32 are the front and back views of an enamelled jewel, with three pendant pearls. This has been designed for enamelling in high relief, as have Nos. 146, 147, and 151. Nos. 51, 53, and 142 are book-clasps. Nos. 118 and 121 are book covers. Nos. 126, 127, 128, 129, 130, &c., are those circlets filled with ornaments, so often met with in the designs of the "petits maitres." Nos. 88, 144, 145, and 152 are girdles; 82 has the appearance of a chain with the motto of the garter introduced. Nos. 55, 53, and 78 are rings. Nos. 56, 57, 58, 59, 60, 61, 63, 85, and 87 are designs for various parts of swords or scabbards. No. 148 is a portable octagonal sundial. Nos. 21, 23, 24, 26, 167, 168, 169, 170, and 171 are terminal figures very well designed. No. 44 is the drawing of a seal, with the inscription "Carolus dux Suffycie (Suffolk) pro honore suo Richemond." The rest of the book is made up of sundry pieces of ornament, which it would be difficult to classify, and a few designs of animals, &c.

It ought however to be remarked that there are certain circlets with groups of figures in them "or impresse" and jewels introduced, these might possibly be intended for "enseigns," to be worn in the hat. No one can fail to be struck in looking over this book with the great use evidently intended to be made of Niello, or black in-lay, an art then exceedingly popular in Italy, through Maso Finiguerra, Peregrino da Cesena, &c.; in fact it is used in nearly every one of the designs. This no doubt was an Augsburg novelty, borrowed from Italy, and popularised by Holbein and others, indeed much jewellery of the age shows this peculiarity. Another most noticeable point in these designs is their entire and absolute freedom from any trace of gothic manner. Holbein no doubt derived great advantage from the works carried on around him by the various admirable Italian masters of ornament, by whom, as we have seen, Henry had surrounded himself. Many of the objects, designs for which are contained in the volume under discussion, were no doubt intended for the new year's gifts, with which kings, nobles and commoners annually reciprocated expressions of good-will, and with the particulars of which the royal and other accounts of the period are teeming. It is quite sad to read these and think how many masterpieces of industrial art are lost to us for ever, and how much pains were wasted by donors and artists—such as Holbein—on "queynt conceits and dainty devyses," concerning even the very ceremony of presenting which the utmost solicitude was displayed. As an illustration of this I am tempted to give the following brief extracts from a contemporary memorandum of instructions to his Chancellor, in the Duke of Buckingham's handwriting, written shortly previous to his disgrace, and preserved amongst the Cottonian MSS.—

" Item that ye cause to be made a cuppe of gold wyth a cover frale wyth the worde* of the best and
" newest facconne wyth my lord Cardinalls badgeys, to the value of xxxli wyth the facconne and all for
" his newyers gyft [*and the same be presented to hym by our trusty councelour John Scot and yf the same*
" *John Scot be seke or otherwyse letted that he kanne not present the same than*] we woll that Mayster
" Thomas Wylloghby present the same and yff John Scott be seke [*that he*] or otherwise letted that he
" kanne not present the sayd [*cup*] goblyt of gold to the Kyngs hyghness and the powmaunder to the
" Quenes grace; than we woll that ye order the sayd Thomas Wylloghby to doo the same; and if ye
" kanne not have hym to perform the premisses as ys aforesayd then we woll ye order [*Jonn Borrell*]
" Thomas Wylloghby to present the new year gyfts to the Kynge and the Queene and Thomas Barnwell
" to my lord Cardinal."

Happily, we are yet able to trace Holbein's immediate connection with this custom in the shape of his exquisite design preserved in the British Museum, for a clock presented in 1544 as a new year's gift to Henry VIII. by Sir Anthony Denny, of the Privy Chamber. The drawing which is splendidly outlined and washed with Indian ink, was formerly in the collection of the great connoisseur Mariette, from whose cabinet it passed to that of Horace Walpole. A similar clock of the same kind as this is still in Her Majesty's possession, having been purchased by the Queen at the Strawberry Hill sale. It has been engraved by Mr. Henry Shaw in his "Dresses and Decorations of the Middle Ages," and was no doubt presented by Henry VIII. to Queen Anne Bullen, either on their marriage or as a "jour de l'an" present, on the first new year's day subsequent to the event.

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* *In the margin* "The words in French on the cup of gold '*wyth good hert.*'"

Although we have not the same written evidence of the fact of its having been executed for a new year's gift as distinguishes the drawing of Sir Anthony Denny's Clock, it is highly probable that the custom led also to Holbein's engagement upon his magnificent design (formerly Mr. Beckford's) for an enamelled gold cup richly set with cameos and jewels, which was executed for Henry VIII. It bears the motto of Jane Seymour, "Bound to obey and serve," together with the initials of the King and Queen. Whether mainly for new year's gifts or not, certain it is that much of Holbein's time was spent in devising beautiful metal work for royalty and the aristocracy; for such may most likely have been produced the fine design formerly the Earl of Arundel's and Francis Grose's for a richly-ornamented dagger handle and sheath; another for an object of a similar nature, with a representation of Mutius Scævola before Porsenna upon the hilt, bequeathed to the British Museum by Payne Knight; and a third (formerly Beckford's), with the car of Bellona, introduced much as one might have supposed it would have been done by Rovezzano or Toto dell' Nunciata, had the design in question been intrusted to one or other of them. The same characteristics distinguish the cups and other objects subsequently engraved by Hollar, from originals principally in the possession of the Earl of Arundel.

In all of these beautiful designs, and indeed in all the accessories introduced in his pictures, the artist has proved his clear practical acquaintance with the technical processes by which he contemplated the realisation of the effect he aimed at. Nothing is left vague; and the artisan is as it were taken by the hand and aided by the designer, instead of feeling himself hampered (as is too often the case in modern designs) by the impracticability of successfully rendering the effect of the working drawing by any process known to either the workman or the draughtsman. I have endeavoured to illustrate this command of technical resources by Holbein, by reproducing a portion of a beautiful design by him for a vase, preserved in the Bodleian Library, Oxford.

While rendering all due tribute to the masterly power of the inventor, justice should also be done to the executants, who must, for the fitting elaboration of such complex and ambitious designs, involving the combination of ornament both superficial and chased in the round, with the human figure nude, and in vigorous action, have been craftsmen of no mean skill. Let us now endeavour to see who some of these were. The king's leading goldsmith, by whom, no doubt, Holbein's splendid designs for plate were chiefly executed, was "John Anwarpe," or John of Antwerp, who was one of the witnesses to his will, and to whom he died indebted in the sum of six pounds, no small amount in those days and in comparison with his own yearly salary from the king of thirty pounds only. Some of his other designs for precious arms, &c. may probably have been wrought by another witness to his will, Anthoney Snecher, "armerer," who is considered by Mr. Franks* to have been one of the "Almayne" or German art workmen employed at the king's palace at Greenwich. Others of this band, probably Augsburgers, as Holbein himself was, since they were the best of all German armourers, whose names have been lost to us, may have executed such objects as the daggers, &c. I have attempted to describe. Of other foreigners whose names are recorded in the traditions of other branches of production, and who may have worked for the king from Holbein's designs, the most worthy mentioned were Jan Mustyan, a native of Enghien, Henry VIII.'s arras maker, John de Mayne, his engraver, and Richard Atsyll, his pretious stone and cameo cutter.

It is curious that the high estimate of the technical powers of Holbein in every department, his universal practical aptitude in fact, which the scanty relics of his working drawings, preserved here and at Basle, vindicate on all occasions, is corroborated by the epithet applied to him in an interesting letter from Erasmus introducing him to Peter Ægidius, wherein he describes him simply as an "insignis artifex," *i. e.* not painter, nor architect, nor sculptor, but simple workman—master of all crafts, the true magister "artium," answering to "the maker" of the Greeks.

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* Discovery of the will of Hans Holbein.

In architecture I would not wish to detract from Holbein's merit, but we have seen, from the number of different able Italians employed by Henry VIII. before the date of Holbein's arrival in this country, how much reason there is to doubt Walpole's assertion that "the beginning of reformation in building seems owing to Holbein." Of his work, so far as I know, one specimen only remains—viz., the porch or "loggia" at Wilton. I cannot admit this, nor indeed has it ever been so considered, as beautiful, but it is at any rate free from any admixture of Gothic detail. Of the two gates he designed for the King at Whitehall, now removed, plates are given in the "Vetusta Monumenta." One of the Whitehall gates was built in glazed bricks, in different colours, and was decorated with four large circular medallions of busts, in terra-cotta, possibly the work of Rovezzano, or one of the other Italians skilled in the processes of Luca della Robbia and the majolica makers of Northern Italy. I have already alluded to the existence of medallions of a somewhat similar kind at Hampton Court and St. Donat's Castle, Glamorganshire, as well as in great quantities in the King's private collection.

One can feel but little surprised at the redundancy of these "tables in erthe," since not only were many doubtless brought to this country from Italy, where, at the beginning of the XVIth century, the productions of Luca della Robbia and his successors, as well as those of the ordinary majolica manufacturers, enjoyed the highest vogue; but it has been recorded that many Italians, skilled in all the contemporary ceramic processes of their country, quitted it to practice their art in other parts of Europe. Thus we know that one of the "Castel Durante" artists, Guido di Savino, and his two sons, made majolica at Antwerp during the earliest years of the century.

What further architectural works Holbein may have done can now scarcely be traced. There is, however, one very important one, which has not hitherto, so far as I am aware, been ascribed to him, but which, from internal evidence, I cannot hesitate to believe must have been executed from his designs. I refer to the splendid woodwork of King's College Chapel, Cambridge. In its way, it is a model of Renaissance wood-carving, revealing in every arabesque, and especially in the ornaments of the lunettes, the peculiarities of classical form as they were first, if I may use the expression, *translated* from the Italian into German by Albert Durer, Altdorffer, Peter Vischer, and others, including Holbein. A comparison of this work with the detail shown upon his admirable design for a richly and highly-elaborated chimney-piece, having on it the arms, &c., of Henry VIII., probably executed for one of his palaces, drawn with the pen, and washed with Indian ink and colour—from the collections of Richardson and Horace Walpole—now in the print-room of the British Museum, will at once, I think, serve to establish the identity between the designers of one and the other monument.

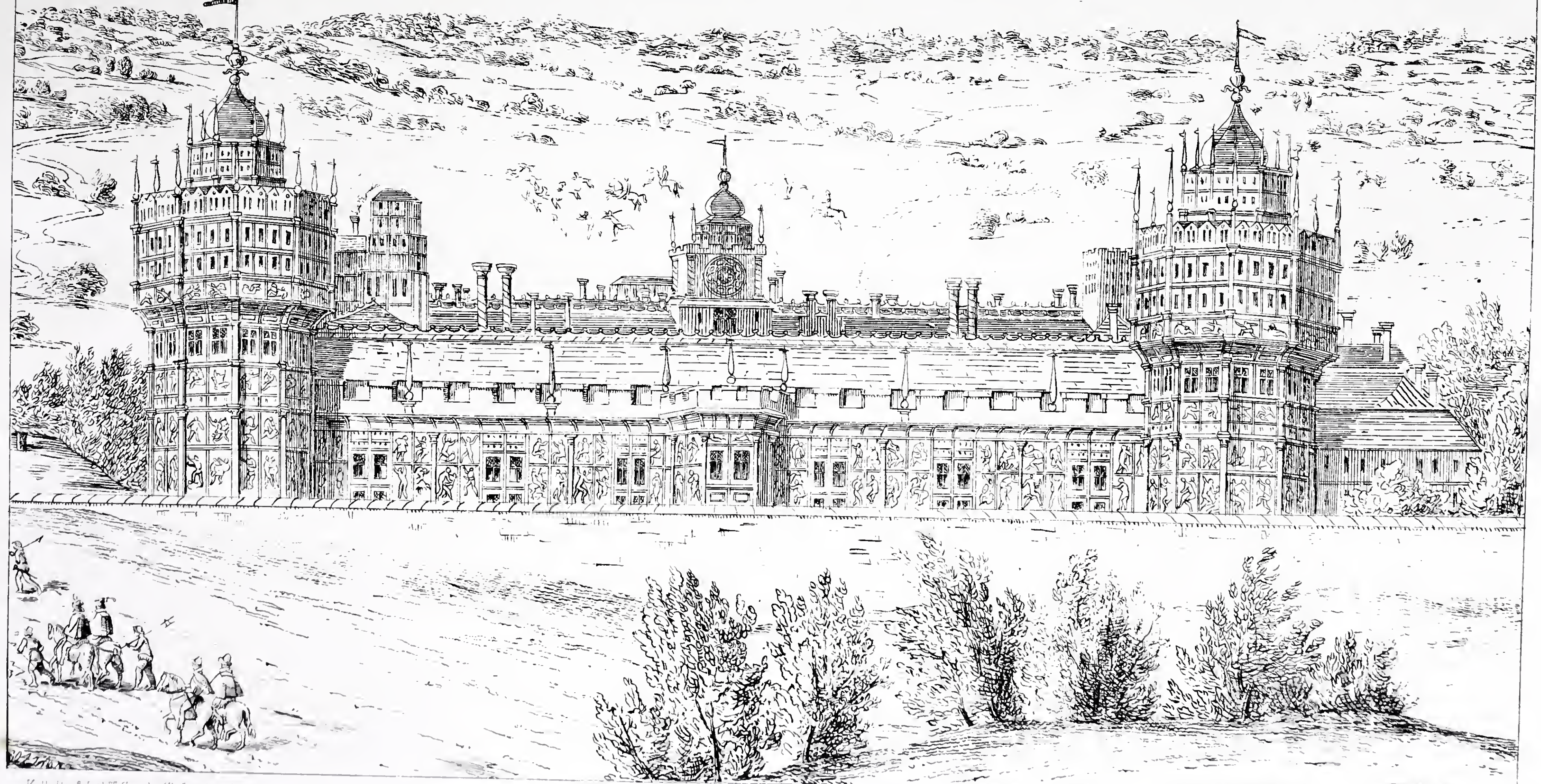
In judging of the influence exercised on architecture and the industrial arts, of which architecture must ever have been and be the foster-mother, by such men as Holbein and the Italians of whom mention has been made, it should ever be remembered that our impressions are derived, not from all they did, but from the "disjecta membra" alone of their greatness which time and tradition have spared to us. Could we but see now the fruits of their lives and labour which have perished, we might probably have quite another impression from the popular one as to the extent and variety of their capacity, and as to the tone they were likely to communicate to all around them.

With Holbein's death, now clearly ascertained to have taken place in 1543, perished the last of the great artists whose talents were trained on the old Italian system of art-education to fructify in every field, and to yield fruit of every variety. From that time forwards, in this country at least, painters were painters, sculptors sculptors, and architects architects; but the great masters of arts, to whom form was everything and the medium by which it was to be expressed a matter of comparative indifference, fade from the range of historic vision.

No research has yet clearly made out who "Johannes de Padua," the celebrated architect who mainly took the place of Holbein as Henry VIII.'s chief designer, really was. The earliest document referring to him appears to be the patent which appointed him "Devizor of his Majesty's Buildings," in 1544—the year after Holbein's death. Mr. Wornum, in a note, supplementary to one by Dallaway on the subject, states the fact that it was in this same year that Girolamo da Trevigi, the former official architect to the King, met his death. He hence infers that Giovanni succeeded to Girolamo. Dallaway observes that in the above year Henry had completed his palaces, and "little more could have been done before his death in 1547." I think it would be altogether wrong to assume from this that John of Padua did nothing for the King before the date of his appointment by patent, since he would scarcely have obtained his formal nomination unless he had already proved his capabilities to that petulant monarch's satisfaction. This view is supported by the terms in which the King granted him in the same year a special fee of two shillings per diem. He gives it of his "assured knowledge," as well as "mere motion," and further, "in consideratione boni et fidelis servitu quod dilectus servicus noster Johannes de Padua nobis in architectura, ac alius in re musica inventis impendit ac impendere intendit." We thus find that he had won upon the King's good graces by his musical, no less than by his architectural skill. Moreover, the works at Nonsuch were far from being complete at that date. After the King's death, Giovanni probably entered the service of the Protector Somerset, for whom he carried out the magnificent palace in the Strand, which was left in a very incomplete state when the once all-powerful noble met his untimely end upon the scaffold.

Beyond his work at Somerset House, which appears to be well authenticated, I must confess that much which has been attributed to John of Padua appears to me apocryphal, and Longleat especially scarcely answers to one's expectation of what a regularly educated Italian architect's work was likely to have been. The necessity for such education began to be seriously felt in England even before the supposed date of the commencement of Longleat (1567), since as early as 1550 John Shute was sent to Italy expressly to study architecture by John Dudley Duke of Northumberland. As Dallaway remarks, John Shute on his return in 1563 published the first scientific book on architecture which appeared in our language. His principal foreign rival was apparently Theodore Have of Cleves. He is honourably mentioned in the annals of Caius College, Cambridge, as the author of the pillar and stone erected in Dr. Caius Court ("hexa contædron toto solariis decoratum"), of exquisite and wonderful workmanship, bearing sixty dials (horologia). He is further on stated to have been "an excellent artist and celebrated professor of architecture," and he is supposed (on, I think, good grounds) to have been "the architect" to whom Dr. Caius had in his lifetime prescribed "the exact model and pattern" to which his celebrated Gate of Honour (completed in 1574 after the Doctor's death) was "curiously worked" in "squared and hard stone." I need scarcely recall to my hearers the strict and pure classicality of this interesting specimen of pedantry. It is a singular illustration of the *multum in parvo* system which may frequently be found in Flemish work, and is strictly and perfectly monumental in every respect except size.

With Have's work and Caius's death, with Shute's return from Italy and the speedy dissemination in England of the general treatises upon architecture which began to be multiplied on the Continent after the middle of the XVIth century, the necessity for the employment of foreigners in this country as architects and designers no longer existed, and in their place there grew up the native school which, headed by John Thorpe, soon increased; so that before the end of the century, numerous as the foreigners may have been who were employed as painters and in some other branches of art, none of any



Kell Bros Lithrs Castle St London, E.C

ALFRED JOWERS, LITH.

NONSUCH PALACE.

SKETCHED FROM HOEFNAGEL'S PRINT OF 1582. TOTO DELL ANNUNZIATA. ARCHITECT.

great importance beyond those already alluded to, seem to have practised as general designers or architects. Still, although not so practising, many foreigners helped to maintain the "prestige" with which all the forms of Renaissance art popular in the other countries of Europe had come to be regarded in England.

A very brief allusion to the principal amongst this great family may, therefore, suffice for our immediate purposes. Those who wish for full details may be referred to the pages of Walpole and Dallaway, with the admirable corrections of Messrs. Franks, Gough Nicholls, and Scharf in a recent volume (the thirty-ninth) of the 'Archaiologia.' The leading foreign painters to whom the portraits supposed to have been painted by Holbein between the year 1543, in which he has recently been proved to have died, and the year 1554, in which until recently he had been supposed to have died, were the three following: Johannes Corvus of Flanders, Gerberius Fleccus—or, as he is occasionally called, Gervas Flick, Fliccus, or Fliccius—of Germany, and Guilim Stretes, a very able artist, whose principal works may be referred to the reign of Henry's successor. From the great care and accuracy with which personal jewellery, the patterns of dress and embroideries, and even architectural backgrounds of Renaissance character, were painted by these artists, there can be no doubt that they were well acquainted with ornament and decoration; but we remain without evidence of their having ever practised design, or influenced contemporary architecture otherwise than as skilful draughtsmen cannot at any time avoid doing. Their main efforts were certainly devoted to portraiture, and there was unquestionably a falling away from the grand activity in monumental art which distinguished the whole reign of Henry VIII. Even decorative painting flourished but little under the auspices of Edward VI. Probably had the Protector Somerset lived to finish his house it might have been otherwise, and he might have given an impetus to the maintenance of those flowers of art of which Holbein and others had sown the seeds.

In Queen Mary's reign we come to Sir Antonio More, who was a native of Utrecht and scholar of Jan Schorel. Originally in the service of Philip II. of Spain, he was sent to England to draw Queen Mary's portrait, which he did in a very courtier-like manner. At the end of her reign he followed Philip to Spain, whence ultimately, getting into disgrace, he returned to the Netherlands, under the patronage of the Duke of Alva. He is believed to have died in 1573. He painted in Holbein's manner, but often neglected to put his name to his performances. They are consequently difficult to recognise. He principally painted portraits, but also executed some few historical pictures.

In Queen Mary's reign we had another excellent foreign artist here for a short time, who was by many of his contemporaries regarded as rivalling Titian, even as a colourist, in spite of the strange extravagancies of disposition and manner which gained him the cognomen of "zotte," or fool. Our hero, Justus van Cleef, Mr. Wornum believes to have died in 1556, and not in 1536, as has been usually supposed. Van Mander's story of the artist's insanity having been occasioned by his disappointment at the failure of his introduction by Antonio More to Philip II. of Spain when he came to England to marry Queen Mary, and which event took place in 1554, furnishes a strong corroboration of the probability that his death did not occur until the later of the two above-mentioned dates. Doubt has arisen as to the nationality of a contemporary of Van Cleef's, the Nicholas Lyzarde (probably Lizardi), who was a leading court painter from 1547 till his death in 1571.

Lucas de Heere, whose allegorical picture of Queen Elizabeth at Hampton Court with the date of 1569 will no doubt be remembered by my hearers, was born in 1534. His father was a good sculptor and architect, and ultimately placed his son under Franz Floris. He became a good designer, and worked for the tapestry weavers and glass painters. I cannot find, however, that he did any thing but paint portraits in this country.

Although after Lucas de Heere many distinguished foreign artists worked in England up to the end of the century—such as Frederigo Zucchero, a decorative painter of great facility; Cornelius Ketel, who painted in public with his feet; and Marc Gerrard, a clever general designer, whose portraits of Queen Elizabeth will be in your memory; Henry Cornelius Vroom, who made the cartoons for the Spanish Armada tapestries burnt in the fire of the Houses of Parliament; Petruchio Ubaldini, the last of the illuminators attached to the Court, &c,—it would profit us little to dwell upon their works or merits. It is enough for us as architects to note their residence amongst us. Happily, the rapid formation of the great English school of architects, to whom we are indebted for the creation of so many of those beautifully picturesque old buildings which we generally call Elizabethan, and which Mrs. Hemans had no doubt in her "mind's eye" when she so well apostrophized—

"The stately homes of England,
How beautiful they stand;
Amidst their tall ancestral trees,
O'er all the pleasant land,"—

released us from dependence upon foreign aid, and kept alive the flame of that lamp of symmetry and comeliness in structure which ultimately, through Jones and Wren, shed its rays far and wide; not through England only, but to every land and clime in which such noble and right royal architecture as theirs will and must be cherished as long as Arts may flourish and mankind endure.

In conclusion, pardon me if I have dwelt at too great length upon my theme. You will certainly do so if I may have succeeded in imparting to you a tithe only of the interest and enjoyment with which I have tried to live again through memory with the pioneers who cleared the way for the onward march of the revival of Classical Architecture in this our native land.

A unanimous vote of thanks having been passed to Mr. M. Digby Wyatt for his very interesting paper, the Chairman (C. Barry, V.P.) proposed to the meeting, that as little or no time was left for discussion, and as Professor Donaldson had some remarks to make on the subject of the Law Courts Competition, Mr. Wyatt's paper should, with his approval, be discussed at the next meeting, on the 8th of June, by which time many of the members who chanced to be absent on this occasion would have had an opportunity of reading it.

Mr. Digby Wyatt having signified his approval of this suggestion, in which the meeting fully concurred,—

Professor Donaldson rose and said: The question to which I desire to call the attention of the Institute has reference to the recent debates in a certain grave assembly, which I have no doubt most of you have read, and in which observations have been passed upon architecture and sculpture, and the arts of this country. You will, doubtless, have noticed the very depreciatory manner in which they have been noticed—the, I may say, flippant consideration with which architects and sculptors have been treated in general in the discussions of Thursday and Friday last. This is a matter of very immediate moment. There were frequent and long debates, and the profession was certainly ably vindicated by Mr. Beresford Hope and Sir Charles Lanyon; and I will invite the members, who have not read these discussions, to peruse them very carefully. In the course of the discussions, there was, as I said before, a good deal of flippant, passing remark made by those, who really know nothing about the subject, who are ignorant of art, and have not a proper feeling for it, and who ventured to call in question the abilities of men of the first talent in this country, who have devoted their time, talents and energies, and incurred an enormous expense, in order to come out with honour in the recent competitions, both in regard to the Courts of

Law and the National Gallery. To those remarks I think we ought not patiently to submit. I think we should put in motion some means of getting our art ably vindicated in the House of Parliament. The great competition in regard to the Courts of Justice was one, which involved great reputations, I may say; and yet it was denounced by one or two members of the House as a perfect failure, and as a result that no one architect could be recommended as competent to carry out the work. Similar remarks were made upon the National Gallery. The designs for this building were of great importance, and it must be admitted by all that they showed a great deal of talent. If in such a case the competing architects are not able to meet all that is expected of them, I think we may regard that almost as the natural result of any competition. The main object of such a contest is to find the man, who is most competent to carry out the instructions presented to him. Now, I will venture to say that the instructions presented to the architects for the National Gallery were most incongruous and ill-digested; but at the same time, however contrary to their own convictions of fitness, &c., the architects are obliged to adhere to these instructions, and to carry out their designs in conformity thereto. How is it possible for any man, any architect, to realize a design which should meet all the requirements that may be supposed to be necessary; to meet all the intentions that might be thought requisite on the part of the propounders, without having personal communications and personal explanations, *pro and con*, with respect to the several points that come before them? The obvious result of competition, therefore, is to procure the man, who shows the greatest ability to undertake the work required of him. Hence, those, who have to decide such a question, should really consider which of the competitors has produced a design that is likely to carry out the requirements of the project, whatever it may be. I would say this in the face of the world. Let the designs, which have been presented with respect to the New Law Courts, be laid before all Europe, and I defy any nation—whether it be French, German, Italian, or any other—to produce a series of designs of such noble conception, so well carried out, so ably delineated in every respect, so artistic in all their bearings, and so reasonable in all their requirements which they provide, as the series of designs which were presented for the New Law Courts. And yet, when the architects have done their duty, all is left in doubt and suspense, and no justice whatever is done to the competitors, the matter being referred upon some legal technical points to the Solicitor or the Attorney-General. That is not a proper position in which architects should be placed. The consequence is; that those who want to make a joke or let fly a witticism in such discussions as those alluded to, immediately avail themselves of the opportunity to say the architects of England are not competent, and that it is difficult to find one who is able to execute and carry out any great design. Now, it appears to me that these are imputations which must be met, but the difficulty is how this is to be done. I have thought this subject of such importance to the profession, that we ought to consider and thoroughly investigate it. We find the same sweeping observations with reference to the sculpture of London. I am not going to defend all the sculpture in the metropolis, but we may say that there are sculptures worthy of the period. And, therefore, when the subject of statues was alluded to it was asked, where were they found? for what object were they made? and there is nothing but contemptuous reproach, that they are put into a storehouse, or as a last resource a position is found for them in Westminster Hall. Now, that is not the way to treat artists who are of an extremely susceptible class. They want encouragement instead of disparagement. We find in all periods, that they have had the most delicate feelings, and unless they are inspired to hope and treated with tenderness, they are really unable to produce those noble works, which should do honour to the times in which they live. Instead of that, we find only discouragement in this country, and flippant remarks, such as those alluded to as having been uttered in those discussions. I do not know whether any of the members are desirous of making any observations in addition to those which have occurred to me; but I may say that I really think it is by no means an unimportant subject to the profession at large.

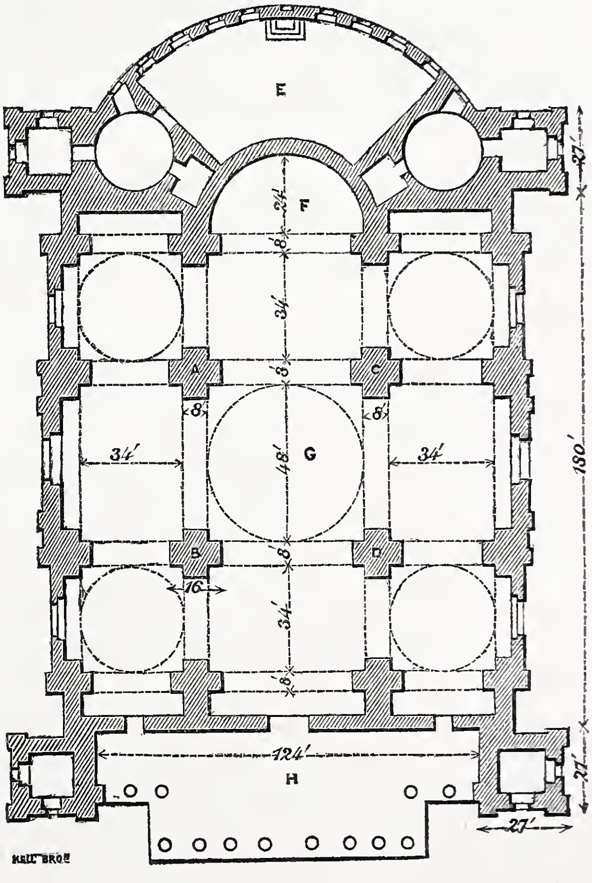
Mr. SEDDON: I consider the subject is a most important one, especially having regard to the way in which such matters are invariably treated by the House; and if any course can be adopted that will tend to vindicate the profession, I certainly think it would be better for us.

No further observations having been made on this matter, the subject then dropped, and the meeting adjourned, for discussion on Mr. Digby Wyatt's paper, to the 8th of June next.

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 8th June, 1868, **Charles Barry**, Vice-President' in the Chair, the Secretary for Foreign Correspondence read the following Communications received from Professor **Lange**, Honorary and Corresponding Member, and Translated by C. C. **Nelson**, Fellow:—

THE FALL OF THE CUPOLA OF THE LEOPOLDSTADT BASILICA, PESTH.



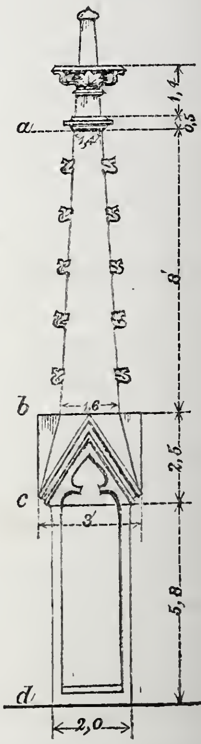
This church (improperly called the Leopoldstadt Basilica) for the Catholic community in Pesth, was commenced after the design of Hild, architect, in 1855. After his death the superintendence of the building was entrusted to Ybl, architect, who forthwith executed the drum of the cupola, already commenced, up to the counterforts, but did not begin the cupola because he had submitted another design to the Minister, which awaited confirmation. In October 1867 cracks appeared in the pier B., twelve feet above the floor, which increased in size after a great storm. The architect, to whom the occurrence naturally appeared suspicious, immediately requested the meeting of a commission, which proved that the quarry stone used in the work was considerably inferior to that required by the contract, and that three years previously important reparations had been made in the eighteen inch thick brick casing. The commission was, however, of opinion that no immediate danger existed, and that the work might be allowed time quietly to settle. Ybl, however, meanwhile set about accurate calculations, which showed that the piers, sixteen feet thick, of the material employed, were in a condition to support the stone cupola with the ironwork, a weight of 50,000 cwt., and yet insure a tenfold security. All this time the cracks enlarged, and in December extended as far as the cross arches. The architect pressed for a further calling together of the commission, which now resolved to take precautionary measures. At first it was proposed to wall up the openings between the piers; but this idea was given up on account of the great number of bricks required, and it was determined to shore up the arches with wood. The work was to be commenced on the 22nd of last January; but on that day about twelve o'clock the piers presented so suspicious an appearance that the work was immediately stopped, and the architect hastened to the Minister to warn him of the impending fall. With all speed a commission was again summoned, but only came together just in time to bear witness to the catastrophe in the ruins of the building. The drum (tambour) fell in, and the weight of the fallen mass of 230,000 cwt. injured many other parts and shattered to pieces the crypt.

Herr Bayer, architect, who took the accompanying plan, attributes the fall to the defective nature of the materials and of the workmanship; for the piers had been built, as usual in Pesth, of mixed masonry, consisting of layers of irregular pieces of soft light gray (often quite white) limestone, alternating with two or three courses of brick. The irregular masses of two cubic feet are placed, of unequal height, close together, the interstices filled with mortar and small bits of stone, and then to bring the various heights of the stones to a level two or three courses of brick are laid, which give a level bed for the following courses of quarry stone. In consequence of this method, by which in many places no bricks, in others some courses occur, a mass is produced which does not afford equal power of resistance in all its parts, and under great weight, as in this instance, must inevitably be crushed and split, because the pressure comes only on detached points. Of the pier B. about fifteen feet are still standing; more remains of pier A.; on the contrary, the piers C. and D. are perfectly preserved. Eye-witnesses state that first the half resting on the piers A. and B. fell in, and then the other half followed.

Of the four bell towers at the angles of the church the two front ones next the entrance are finished and terminate in a platform with a gallery. The last story of the other tower is incomplete, but the chapel, complete in itself, is ready and used for divine service.

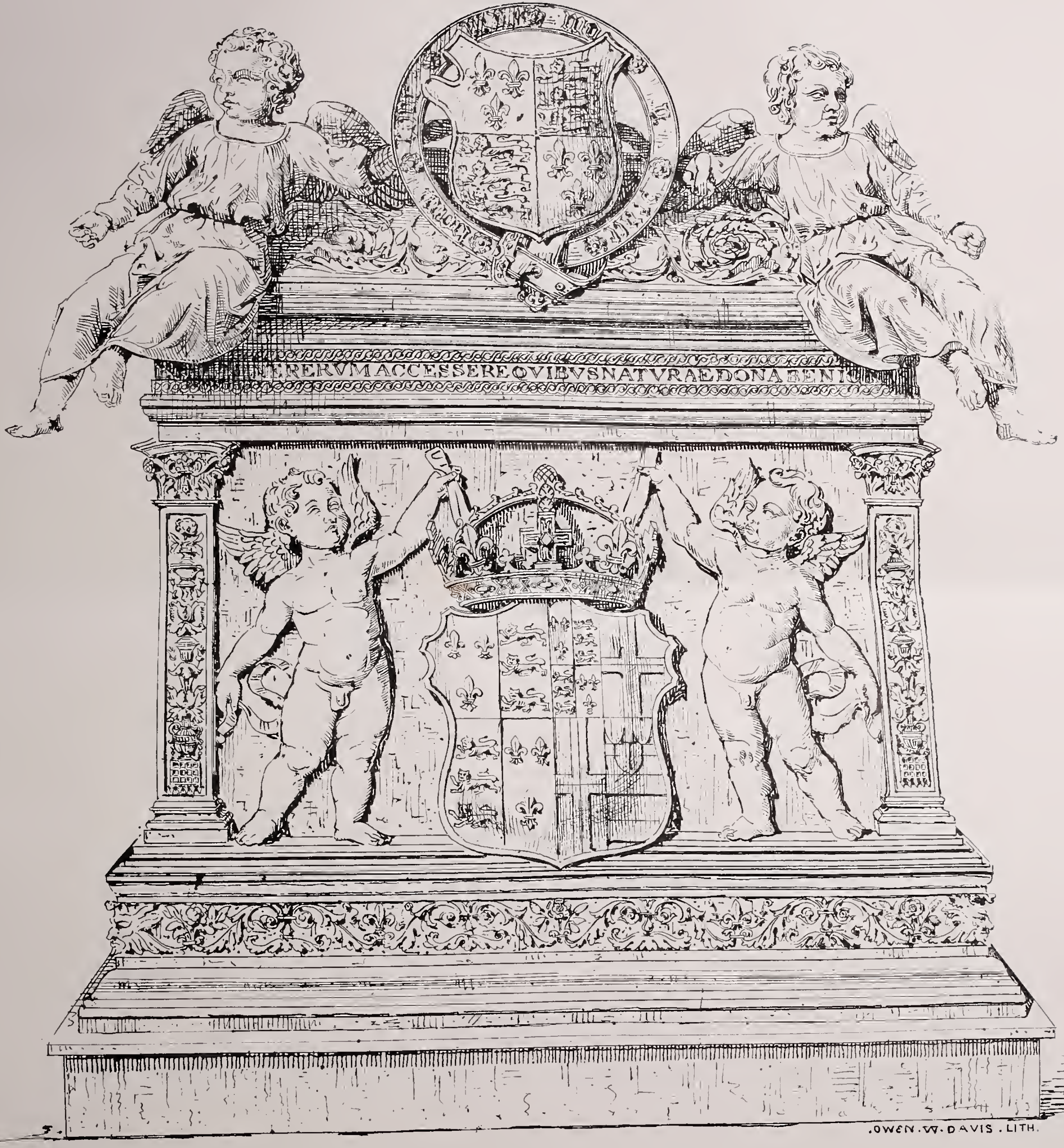
MEMORANDUM TO DETERMINE THE PRESSURE OF THE WIND.

In the beginning of this year so violent a storm raged at Offenburg in Baden, near Strasburgh, that two pinnacles fell down from the tower of the new Gothic Evangelical Church, and partially destroyed the vaulting of the building. The pinnacles (shown in the sketch) were of red sandstone, a cubic foot of which weighs about one hundred and twenty pounds, so that each pinnacle weighed about 60 cwt. At the beds *a*, *b*, and *c*, the stones were well connected by iron dowels, but not at the lowest bed, *d*, on which the turning over took place. The superficial contents of one side of the pinnacle amount to about thirty square feet. This is the size of the surface exposed to pressure, supposing the wind acted perpendicularly to it. Assuming now the united force of the wind on the pinnacle in the centre of gravity of one of the side faces (at about seven feet from the base), and comparing the momentum of pressure with the stability of the pinnacle, we arrive at an air pressure of about thirty pounds on each square foot of the side surface. Such a pressure corresponds to a velocity of the wind of about one hundred and thirty feet in a second; but as the mean direction of the wind is ten degrees towards the horizon, the velocity was somewhat greater to produce the observed results. Whenever the height of such masses much exceeds their breadth, we must be careful to connect such pinnacles together with deeply inserted dowels, however secure such detached construction may appear by reason of their weight. In the present instance the breadth is to the height about as 1 to 8.



F. LANGE, Professor.

Carlsruhe, May 1868.



.OWEN.W.DAVIS.LITH.

THE END OF HENRY VII$^{\text{THS}}$ MONUMENT, BY TORIGIANO.

Sketched from Cottingham's Henry VII$^{\text{ths}}$ Chapel.

The Meeting having then proceeded to the

DISCUSSION ON MR. M. DIGBY WYATT'S PAPER—

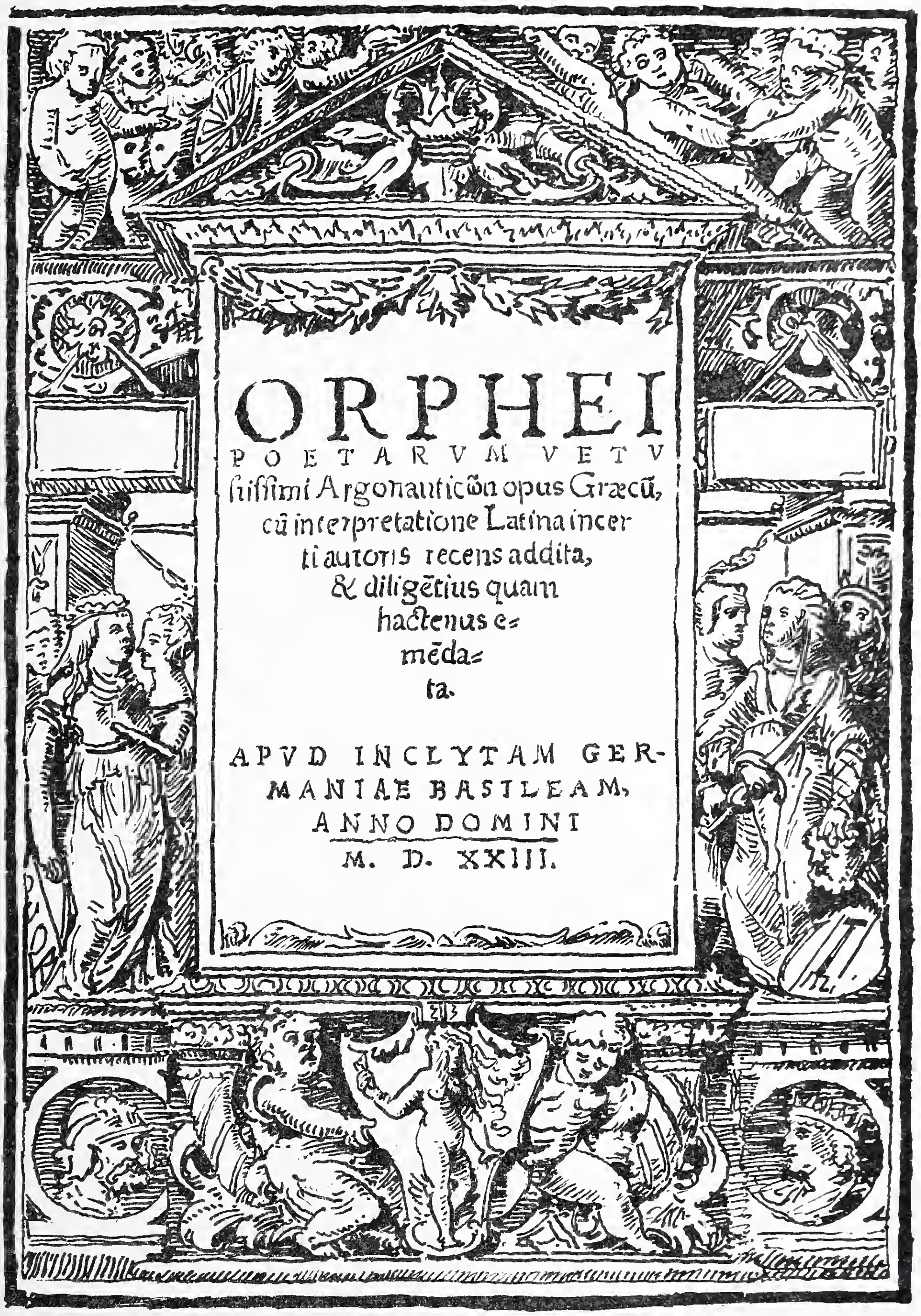
"On the Foreign Artists employed in England during the 16th Century, and their Influence on British Art,"

Mr. M. **Digby Wyatt**, Fellow, in opening the discussion, said: Since the date of the last meeting, such leisure as I have had has been mainly devoted to endeavouring to add to the interest of my paper by supplying what one of the members then suggested it was rather deficient in, and that was graphic illustration. I felt while completing that paper that I had not time to prepare diagrams upon a large scale, and if I had done so upon a small scale, they would have been entirely inoperative as illustrations when hung upon the rather dimly-lit walls of this large room. I preferred to spend the time necessary for anything of that kind in putting on stone, and thereby on permanent record, such illustrations as I thought necessary in such a form as might be printed in the Transactions of the Institute. Permit me, Sir, before the discussion is opened, to take this opportunity of explaining what illustrations I have made as an addition to the subject of my paper. My attention was first directed to the monument of Dr. John Young, in the Chapel of the Rolls Court, partly because of its great interest as one of the finest works of its kind in existence, and partly because it has never, to my knowledge, been adequately illustrated. By the kind permission of Mr. T. Duffus Hardy, and with his assistance, I made a careful examination of the monument, measured it, and have had it drawn out; and I hope in a few days, if I can possibly get time, to be able to trace it in lithography, to be printed and circulated with the report of this discussion. Now this monument is peculiarly interesting—of far greater interest even than I thought it was when I alluded to it in my paper—because I find from the inscription upon it that it was finished in the year 1516. It was in that year that the contract was entered into with the executors of Henry VIIth's Chapel for the monument of the king, which, therefore, clearly proves that the monument in the Rolls Chapel took precedence of the monument in Henry VIIth's Chapel. From that circumstance I think we may fairly assume that when the Florentine merchants brought over Torrigiano to this country, they had an ulterior eye to his employment upon the monument of Henry VII., which they knew was likely to be speedily set in hand; and that, in order to prove Torrigiano's competence for the execution of the more important work, they obtained a commission for him to do this, as a sort of trial piece. I have never been able satisfactorily to identify all the circumstances which connected Torrigiano with this monument to Dr. Young; but Mr. Hardy has promised me to look through the contemporary records connected with the office of the Rolls, and to see if he can find any definite recognition or written proof of Torrigiano's employment upon it. The style you will, I think, recognise, even from my rough sketches, is so clearly Florentine of the most elaborate kind that you will say at once that it could have come from no man's hand who was not a rival of the great Michael Angelo himself. The different parts of the monument are free from the dwarfed imitation of the antique common in early cinque-cento work; and in the bold forms of the mouldings, the large sunk channellings in the "cavettos," and the simple grandeur of the sarcophagus, they exhibit Italian architecture in the fully developed forms specially affected by Michael Angelo and his School. I think it is peculiarly interesting when you come to compare them with the architectural parts of Henry VIIth's monument, in which the architect was probably more hampered by the instructions of the executors for that monument. I have here the original sketches and measurements which I made in the chapel, and you will see from the beautiful head of Christ, which forms the centre feature of the lunette, how fine in style the characteristic modelling of the monument to Dr. Young really is. In order to compare with it, I caused a lithograph to be prepared of the end of Henry VIIth's monument, which will be published with the report of this discussion. *That* you see is in perfect cinque-cento, but in a weaker form, if I may use such an expression.

Professor DONALDSON.—I understand it is from the sarcophagus tomb of Henry VII?

Mr. WYATT.—Yes, it represents one end of the tomb. Then, for the sake of comparison with that, I have reproduced roughly on stone a sketch I made last year from the best of the terra-cotta heads from St. Donat's Castle, Glamorganshire; and I have also added studies from some of the designs made by Holbein for the illustration of books, before he came to England, for the great printers Froben and Bebelins, of Basle, and Treschel, of Lyons. Then I have here, also drawn from the original, the figure of St. George and the Dragon, which I think is very interesting, because you will remember that in my paper I have described the monument of Henry VIII.; and from that description you will recollect that it was determined to have an equestrian statue of the king, as large as life, for the centre of the tomb, and around the pedestal for that statue were to be bas-reliefs from the legend of St. George and the Dragon. My impression is that the first design for that monument may very likely have been an equestrian statue of St. George and the Dragon in the centre, with the king and his queen on each side of the equestrian statue. As it exists, the statuette is certainly very English in its subject and character. As this very interesting work of art happened to be in the possession of one of my clients, Mr. Louis Huth, I was fortunate in being permitted to make the drawing from it, which I have attempted to lithograph. This other plate I have sketched from the beautiful drawing by Holbein preserved in the Bodleian Library, which you may possibly remember to have seen in the Loan Collection at South Kensington. The original vase was no doubt executed as a present from the king to Queen Anne Boleyn. It shows many of the best characteristics of Renaissance Art; and if you consider the early period at which this and other works of the same kind and by the same master were produced, you must regard them as important illustrations of the style and character of the handicraft of the man who certainly more rapidly changed our national style of design, if not in architecture, at least in art industry, than any other person before or since his time. I have also here, Sir, by way of giving some illustration of the only building fairly referable to any of Henry VIII.'s Italian protégés, a drawing on stone taken from the rare print of the period, by Hœfnagel, of the façade of Nonsuch. I will not say that this was a beautiful building. It was too fantastic, but the blame for this it would be scarcely just to attribute to its architect. One of the faults of Henry VIII. was that he dictated too much to the people he employed, and caused the most incongruous subjects to be introduced and models followed. I have no doubt, however, that the little figures alluded to by Evelyn and Pepys were works of a very high order of merit indeed, or the former, at least, who was a really accomplished judge, would not have admired them.

I have made these few remarks in order to put the meeting in possession of the kind of illustrations which I thought would best accompany the paper; and now, if you will allow me, I will listen to any written or oral communications which any of the members may please to make upon the subject of the paper; and if it should be within my competence to afford additional information by way of sequel or response to any of those communications, I shall be extremely happy to do so, after I may have had the pleasure of hearing them.



ORPHEI
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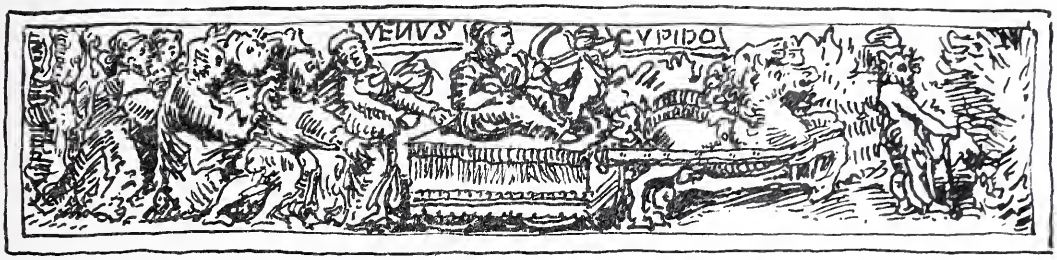
APVD INCLYTAM GER-
MANIAE BASILEAM,
ANNO DOMINI
M. D. XXIII.

M. DIGBY WYATT.
DELT ET LITHT.

FRONTISPIECE DESIGNED BY HOLBEIN · MDXXIII ·

FROM A VOLUME IN THE POSSESSION OF M.D.W.

Nº 1.



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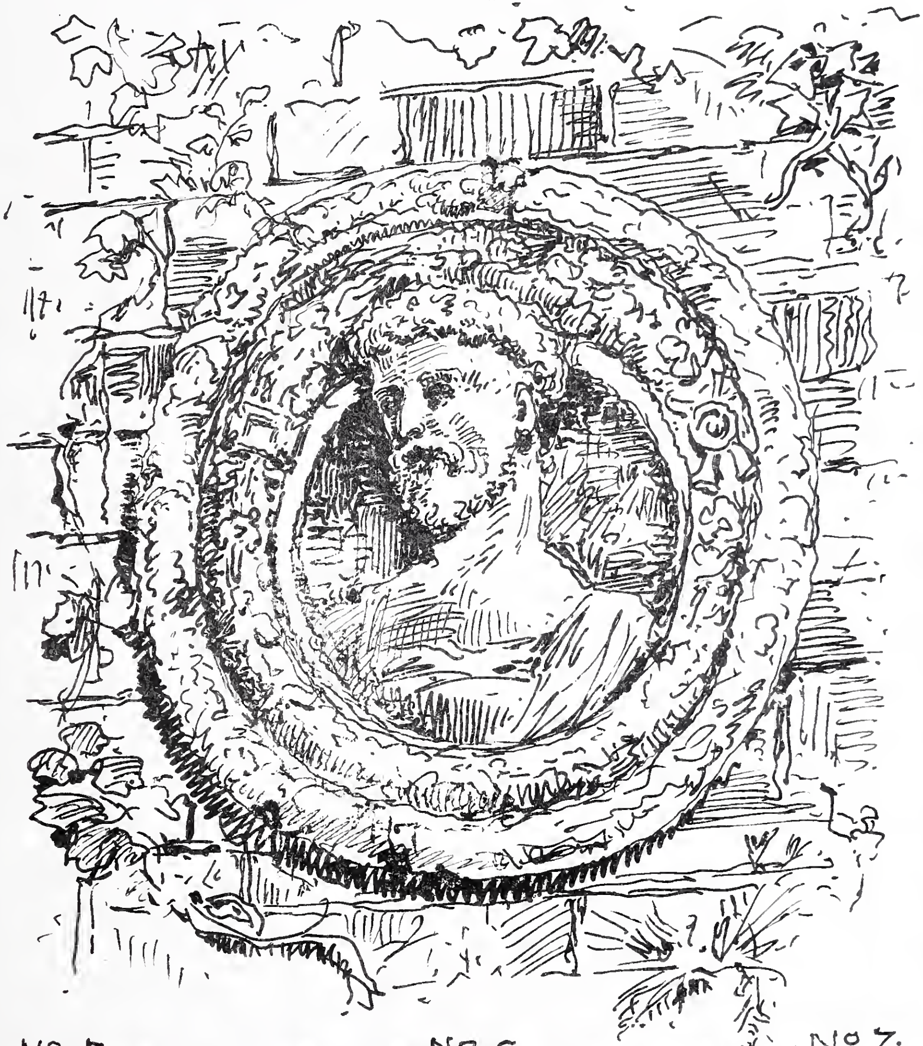

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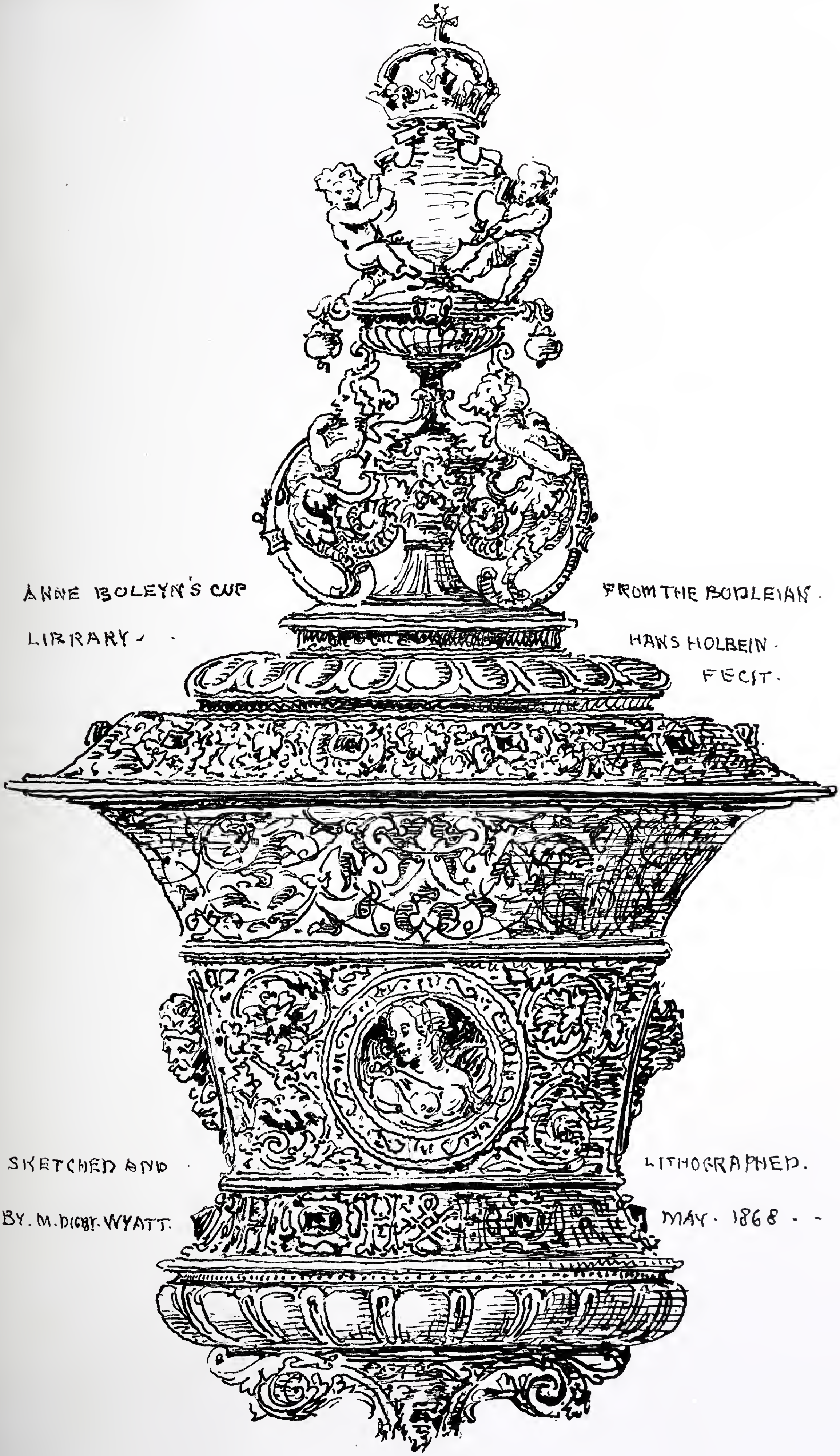
Nº 4. TERRA COTTA ROUNDEL · ST DONATS CASTLE · GLAMORGANSHIRE ·
ASCRIBED TO BENEDETTO DA ROVEZZANO ·
NOS . 1. 2. 3. 5. 6. 7. DESIGNS BY HOLBEIN TO ILLUSTRATE THE WORKS OF ERASMUS ·

M. DIGBY. WYATT.
. DELT. ET. LITHT.



ANNE BOLEYN'S CUP FROM THE BODLEIAN.
LIBRARY. HANS HOLBEIN.
FECIT.

SKETCHED AND LITHOGRAPHED.
BY. M. DIGBY. WYATT. MAY. 1868.

The following remarks on Mr. M. Digby Wyatt's Paper, by Mr. M. GORDON HILLS, Associate, were then read :—

Mr. Digby Wyatt has mentioned Theodore Bernardi and his two sons, Antony and Lambert, brought to England, as he states, by Bishop Sherburne, in 1519. I may add, from Dallaway's examination of the parish registers in Chichester, that this Antony, the son, died in 1619, aged 105; he was therefore only five years old when his father came over to work for Sherburne, and the paintings executed at that time must be attributed to the father, Theodore Bernardi, alone. A part of his paintings in Chichester Cathedral, *quasi*-portraits of the Sovereigns of England from William the Conqueror to Henry VIII,, were absolutely destroyed by the fall of the spire, February 21, 1861. The rest were taken down when the ruins were cleared away, and have been preserved and refixed, though not in their former position. The two great pictures referring to the foundation of the see by St. Wilfred and Cœdwalla, the Saxon King, and the patronage of it by Henry VIII., are now at the back of the chair stalls under the great arch of the south transept. The portraits of the bishops from the foundation of the see are now in the north transept, under the great window at its north end. For the history of art these works had lost much of their interest, in consequence of their treatment by Tremaine, of which Mr. Wyatt has spoken ; but there is in existence a series of untouched paintings, I think unquestionably by the elder Bernardi. These paintings are at Amberley Castle, Sussex. This castle is the property of the Bishops of Chichester, and in Sherburne's time was one of their residences. An upper chamber in it has still considerable remains of oak panelling, of Sherburne's time, and bearing his initials, R. S., carved as well as painted. In the panels are painted a series of female figures, the meaning of which was long a puzzle to antiquaries. Mr. Scharf, at the Society of Antiquaries, and Mr. Albert Way, and others, offered some probable conjectures; but I happened to show to my friend Mr. J. R. Planché, *Somerset Herald*, photographs of five of the *quasi*-portraits, when he at once hit on the truth, and explained the whole matter. This was in 1864, and his solution will be found in the " Journal of the British Archæological Association " for that year. The series consisted of nine portraits; of two of them now very little remains, and their remarkable coats of arms identified them as a series of " The Nine Worthy Women of the World," which painters and romancers of that period were fond of delineating, the artist or the poet being very much given to make his own choice as to the personages to be enrolled in the Worthy Nine. Amongst those depicted at Amberley we have Semiramis, Queen of Babylon; Thamaris, Queen of the Massagetæ; Queen Sinopis of " Ennay;" and Cassandra; with, probably, Minthia and Hippolita, Amazons. All of them had explanatory legends, but these were painted out, most likely, in the time of Charles II., when some additional painting was certainly done in the room, and are now only partially displayed afresh. Although the margins were thus repainted, the pictures themselves were not interfered with, and Robert Sherburne's initials, R. S., may still be seen upon some of them. These, I think, must be regarded as highly valuable specimens of Bernardi's work. I may add that his sons continued to exercise their father's profession in Chichester, and apparently in a descending scale. Lambert Bernard, son of the before-mentioned Lambert, was baptised in 1627, and is probably the same " Lam. Bernard, Pict." whose name I noticed on the cathedral weathercock, when it came to the ground in 1861, with the record that he gilt it in the year 1675. To the first Bernardi, commonly believed to be Theodore, it is usual to attribute a good deal of Renaissance arabesque work, which at different times I have seen exposed from beneath more modern coatings on the nave vaultings of Chichester Cathedral, and which is to be seen very extensively on the vaulting of the choir of the neighbouring abbey church of Boxgrove. I say, *is to be seen*, because, although Boxgrove Church has recently been restored, and I have not since seen it, I have not heard that this has been disturbed. Mr. Wyatt has followed the popular account in naming the head of the Bernardi family, Theodore, but it is worth notice that in Bishop Sherburne's own papers, as pointed out by the Rev. G. A. Clarkson ("Sussex Archæological Collections," vol. xvii. pp. 211, 212), "Lambert Bernardi, the painter," is at least twice mentioned, and not Theodore at all. I do not see in Mr. Wyatt's list the name of a Dutch artist, Stevens, of whom Pennant speaks as "an able statuary, painter, and medalist." For my acquaintance with the matter I am again indebted to my friend Mr. Planché. Stevens was employed about 1594 by John Lord Lumley, or at any rate before the death of that nobleman in 1609, to paint a series of historical portraits of his ancestry, and these may still be seen at Lumley Castle, Durham. One of them, representing Sir Ralph Lumley kneeling before King Richard II., Mr. Planché at once identified as being copied, so far as the figure of the king is concerned, from the ancient picture of that Sovereign still existing in the Jerusalem Chamber at Westminster, and engraved in Carter's "Ancient Painting and Sculpture." On a careful comparison of the two pictures, it is impossible to doubt the correctness of Mr. Planché's suggestion. The other *quasi*-portraits are in costume of the fourteenth, fifteenth, and sixteenth centuries, pretending to represent individuals in a regular line as far back as the time of William the Conqueror, and it seems highly probable that they, too, are copies from some other pictures with which the artist was familiar.

Mr. E. C. Robins, Fellow, then read his remarks on the same Paper, as follows: It is with great diffidence that I venture to express very hastily the thoughts to which my perusal of Mr. Wyatt's paper has given rise. And I only submit them, as in duty bound, to add my mite to the full discussion of the interesting questions provoked by Mr. Wyatt's learned and elaborate paper, the biographical accuracy of which I accept as incontestible. There is something especially refreshing and invigorating in the unhesitating adhesion of such a man as Mr. Wyatt to principles not now particularly popular. One is carried back to the days of one's pupilage, when the absolute divinity of Grecian architecture was a leading article of professional faith, and the Roman art of the Augustan age its only rival for supremacy. Mr. Wyatt boldly appears, not as the apologist, but as the champion of the much-abused Renaissance style of art, and the recorder of the histories of those men to whom he says we owe "the rapid formation of the great English School of Architects, to whom we are indebted for the creation of the so-called Elizabethan, and who kept alive the flame of that lamp of symmetry and comeliness of structure which ultimately, through Jones and Wren, shed its rays far and wide, not through England only, but to every land and clime in which such noble and right royal architecture as theirs will and must be cherished as long as arts may flourish and mankind endure." The foreign source of the stream of art thus overflowing this country is indicated in the title of the paper; still Mr. Wyatt is at some pains to show the national character of this new development of the arts here. He gives it as his opinion that English Gothic Art was in its decrepitude, that Renaissance was in its prime, and that the result of their association was "the birth of an entirely new phase of art," culminating in the triumphant ascendancy of foreign ideas, and the revival and permanent establishment of Classicality. The philosophical remarks at the opening of the paper and dispersed throughout it do not appear to be the logical consequence of reasoning upon the facts, but rather the statement of the premises of an argument attempted to be supported by facts, but which the facts collected fail to sustain, and in many cases seem to contradict. Thus, English Gothic Art is stated to be in its decrepitude at a time when Beauchamp Chapel, Eton College Chapel, St. George's Chapel, Windsor, Bath Abbey, Henry VIIth's Chapel, and King's College, Cambridge, were the embodiments of the "technic, æsthetic, and phonetic" condition of the arts of this country; buildings which Mr. Wyatt acknowledges "were of remarkable merit in technical execution, as well as in grace and beauty of design," and he does not point to any subsequent works of equal extent at all comparable with them. The Wars of the Roses sufficiently account for the decline in some of the industrial arts, in sculpture, painting, and jewellery; but they do not seem to have retarded the conception and execution of the great works before mentioned; and the decrepitude of English Gothic Art would not seem to have existed until premature old age resulted from the neglect of it by Church and State. And who was accountable for this but Henry VIII. himself, who introduced foreign elements of design against the will of his people, which led to the popular rising described by Mr. Wyatt, which was put down by brute force only, but which still found vent in the ballads of the time? This prince, instead of nourishing native art, patronized foreigners of all descriptions, and the native art force, having reached such a culminating point of excellence as evidenced by the buildings referred to—which, admitting all their faults, have nothing like them in the world—was crushed out of it by disappointment and discredit, and want of encouragement from either churchmen or statesmen. And from that time to the present foreign fashions have been preferred to native worth.

"With the development of the principles of the Reformation, men naturally refused to put new wine into old bottles," says Mr. Wyatt; "and the country, beginning with Royalty, and proceeding through the chief nobles and successive Ministers of State, ripened for that inoculation of novelty from abroad which, as we shall have occasion to see, rapidly supplanted the old systems of progress by spontaneous internal national combustion."

What! is it a thing for which we have any reason to be congratulated that the "inoculation of novelty from abroad should supplant the old systems of progress?" Does Mr. Wyatt doubt that those principles were sound and true? Was not the distinctive character of the arts as they existed in this country at the period, its national glory, as the exponent of its individuality and the outcome of the religious aspirations of its people? Did it not possess the charm of native beauty, in common with other distinct styles of art, the intrinsic worth of which are just in the same proportion that they were the expression of the necessities of the originators, their earnest craving to worthily represent their ideal of beauty or magnificence, their desire to exhibit their fear of the gods, honour to the king, and respect to themselves? Is it not illogical to assert that such inoculation by force from without was the result of "spontaneous internal national combustion?" Surely it was not the love of the profane arts introduced by foreigners that made them flourish; they never were popular till generations of apathy had passed; it was owing to the patronage of the influential few—the King and his Court. Was not the Elizabethan style provoked by the lingering love of the people for its own forms of art and its determination to engraft upon the foreign taste all of English feeling that it could?—a final protest against the imputation of decrepitude. The *life* of art was not in the importations from abroad; what of life remained was indigenous to the soil. The absurd incongruities of Nonsuch Palace found no popular sympathy, any more than the Brighton Pavilion. And once let loose by the wiser policy and purer taste of the Cardinal, the native arts revelled in the pleasantries of Hampton Court, of which old Skelton sings:—

"The Kynge's Court
Should have the excellence;
But Hampton Court
Hath the pre-emynence."

English art died no natural death, was suffered to reach no decrepitude, but was tortured and finally strangled by that same egotistical Prince whom Mr. Wyatt delights to honour—who sacrificed so many other "graces" to his lust. But Mr. Wyatt does not seem to see the caustic wit that suggested the placing of the "hoole personage" of Henry VIII. on the curling locks of the capital of an Ionic column. Again, is it fair to the spirit of the reformed religion to say that the new wine was put into new bottles because the old were not trustworthy, when in fact it was enshrined in those very forms of art dedicated to the special service of the still unreformed religion? Rather, was it not indicative of the incongruities of the age, whereby the suppression of bigotry was made the business of an impure Prince? Yet Mr. Wyatt would ratify the spurious title of "Defender of the Faith," and add the equally well deserved title of "Regenerator of the Arts." Whatever the genius of the foreign artists, however great their technical skill in the details of the arts of sculpture and painting and industries of the period, there was no heart, no love, no noble ideal. The old Church had corrupted itself and was despised; the new was made despicable by its supporters, was wounded in the house of its friends; and the result was that no religious aspirations inspired the age, either here or abroad, and forms of art naturally partook of the learning of the schools—"the Renascence" intellectualism, as Mr. Matthew Arnold writes it—and heathen mythology was the accepted storehouse of symbolism; a state of things well reflected in the pages of Ruskin, who says in his fourth Edinburgh Lecture:—

"The world has had a Trinity of ages—the classical age, extending to the fall of the Roman empire; the mediæval age, extending to the close of the fifteenth century; the modern age, thenceforward to our own times; a change taking place about the time of Raphael in the spirit of Roman Catholics and Protestants both, a change which consisted in the denial of their religious belief as theretofore expressed in the outward things of life. Thus, before the revival of Classic Art the very furniture of the King's house was made to confess his Christianity: it may be imperfect and impure Christianity, but, such as it might be, it was all that men had then to live and die by; and there was not a pane of glass in their windows nor a pallet by their bedside that did not profess and proclaim it. Since that period the decoration has consisted of Cupids and Graces, Floras, Dianas, Jupiters, Junos, &c., as if we were born heathens; so that the great broad fact which distinguishes modern art from mediæval is this: that all ancient art was religious, and all modern art profane."

"Freedom and hope," says Fergusson, in his 'True Principles of Beauty in Art,' "are the first two principles of greatness in art as in everything else; and servility and despair of doing better than has been done before must cramp the noblest genius and hide the highest aim."

It has been well said that if there is one word by which an artist or critic may be tested—a single term in which all truth in art and all virtue in action might be summed up, in which we could find all the essence of a mind or the purpose of a life—it should be the term Ideal. The reception of this term in all its consequences, or on the other hand its utter rejection, at once determines what an artist is in his end and aims. To have *no ideal* is to have nothing to strive for or hope after. The Ideal should be the end and aim of the Fine Arts, as distinct from Engineering. It was Coleridge who said that a "picture was an intermediate something between a thought and a thing." The thought and the thing stand respectively for the outward world of matter and the inner world of mind. The thing or object is received and taken from visible nature into the inner mind of the artist, and there, being elaborated and combined with his individual idiosyncrasy of thought and feeling, comes forth a second time into actual existence under the new and created form of Art. The primary, the raw material is nature, the forming however is mind, and the ultimate product Art. Nature enters into the mind a fact, a reality, and issues forth a picture, a poem, an ideality. To the nature around him the artist adds his own nature.

"And thus it is that native air
Mind informs with visions fair."
"Within the pale
We stand, and in that form and face behold
What mind can make where Nature's self would fail."

In an estimate of the conditions under which the "creation of an entirely new phase of art" is possible, why does Mr. Wyatt ignore the effect of the absence of any noble ideal in the influence of foreign artists on British art? All true development is from within and thence without, inward enlightenment expressing itself in outward from; and all true and noble art is an outward and visible sign of an inward and spiritual gift or grace. Take the life of Torregiano, "the first great Italian master upon whom the King most fortunately lighted," says Mr. Wyatt, and consider for a moment what great development of art in its highest range may be expected from the mental laboratory of one who begins life by breaking the nose of Michael Angelo, (whom he always hated, says Vasari, because he was superior to himself,) who was afterwards employed by Pope Alexander at the Vatican, but whom he speedily left for the army because the pay and spoil attracted him. Disappointed of the promotion he coveted, he returned to his art, which for itself he had no love, and worked in bronze and in marble such things as his sordid mind could conceive and his facile fingers embody. It needed little purity of soul to please the voluptuous Harry; so he was invited to England, lured by the better pay; but here this ill-conditioned man, the pioneer of the mercenary artists who followed him for the same good pay, was soon obliged to leave for Spain, where he got into trouble for smashing a figure of the Virgin, for whose purity he can have had no reverence, no heart to portray; and art can have consequently suffered little loss by the demolition. Yet it is to such a man and to such men that the students of the nineteenth century are bidden as to a festival of good things. But I believe it to be as true to-day as twenty years ago when Fergusson uttered it—

"One of the most fundamental rules of art is that sordid minds cannot express elevation, the impure cannot express purity, or the vulgar mind elegance; if we want lofty, pure, and elegant art we must go to minds where those feelings exist; for all arts are the reflex of the individual or the nation practising them, and the improvement must come from within, either from more sedulous cultivation of purity and the higher emotions or by a more honest and straightforward mode of expression than has hitherto been adopted. On the other hand we may feel perfectly certain that all that is bad in the individual or the nation will come out in their art, however much they may attempt to disguise it by foreign costumes or plumes borrowed from those who were artists not only in form but in spirit. Art must come from the heart, and can only come from thence."

We do not want artists to give us a picture of what nature *is* only (*that* Torregiano and others like him may do), but what they *think* of nature (and who cares for the thoughts of such a man as he?) The mere copying of nature is not the ultimate end of art. Man has to infuse something of *himself* into the picture or building. It is the artist or me; acting on the Not me. We do not want a dwarfed and caricatured naturalism, but an inspired literalism. What seems most required to effect a revivification of the arts at any period of their decline is inspiration, besides that which may be learnt at schools; and this is often the fruit of honest labour and of pure thought.*

I hope I have made clear the points on which I am chiefly disappointed in Mr. Wyatt's otherwise remarkable paper, which opens a new page in the history of art. At the same time let me say that I greatly sympathize with Mr. Wyatt's cosmopolitanism, and would desire to steer clear, as he has done, of the error of those whose preconceived preference for some particular style or phase of art, blinds them to the beauty of others; but I should wish to avoid latitudinarianism. To more accurately define my meaning, I cannot do better than quote, in conclusion, the following contrast between Grecian and Gothic art, sent to me in a letter from my friend the Rev. G. B. Porteous, who thus sums up their powers and limitations.

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* The recognition, appreciation and interpenetration of the "true styles." Surely it is the union of Strength and Beauty, not the association of decrepitude and pedantry to which we should look for the "birth of an entirely new phase of Art."

"In sculpture one sees nothing so fine as the Greek remains. It is a shame that the idolater should have stood nearer to nature and have wrestled more triumphantly with her veiled angel than the sculptors of any Christian age. The only Christian sculpture of profound merit is to be found in the general style and execution of the cathedral. Here, indeed, is something which in uniting beauty and perfection stands far above the graceful temple of the Greek or the more massive structure of the Egyptian, and is calculated by its general effect to lead the soul into states where the imprisoned loveliness within the soul itself can burst its fetters and execute the behest of the Divine Original. In classical civilization among the Greeks we had finer architecture than has ever been seen since. The sons of Hellas, a national incarnation of intellect, the grand *avahier* of genius, the light bringers of the world, were real architects; as real as unreligious men could be. Let their Archaic sculpture give the first response; and next, is not their architecture clear, finished and faultless? Is not the symbolic character of Greek architecture a reflection of well-defined ideas though of miserably dormant affections? Is not the very completeness of Grecian architecture symbolical of a mind habituated to ideas well formed, which it effectually grasps, while yet ignorant of those aspirations which ascend heavenward to the unlimited vastitudes of the infinite and eternal, of which a Gothic cathedral is so befitting and so magnificent an expression? The Parthenon is thought manifested in marble; York Minster is faith reflected in stone. One is the product of intellect; the other is the offspring of the moral sentiments. The first is an idea; the last is a prayer. Artists designed the former, but saints must have conceived the latter."

Professor DONALDSON, Hon. Sec. For. Cor.—If I understand Mr. Digby Wyatt's paper aright, and the intention with which he has written it, I should say, that it was not to justify the introduction of a new style of art, nor to condemn the old one, which really seemed to have exhausted itself; but merely to follow out and to give us the history of the artistic training of the mind, which eventually produced the invention or adoption of a new style of art altogether. I think Mr. Digby Wyatt was quite justified in saying that Gothic art at that time was in a state of decadence, because, if we only look at the exterior of Henry VIIth's Chapel, we must own that there was then great degradation of taste. And there is no one, who has studied Gothic or mediæval art, but must acknowledge, that at that time it was not worthy of continuing its career. There is a difference when we consider the vaulting of the chapel itself, because that was rather the scientific work of the mason than the artistic combination of the architect. The structural skill, with which the vaulting is arranged, is such as to surpass almost any previous combination of a like nature; and in point of art there is exquisite beauty. But the exterior of Henry VIIth's Chapel altogether certainly shows, that art had arrived at a very low ebb in point of taste. We are much indebted to Mr. Digby Wyatt for going through the analytical study of the development of the new style of art in this country, following it through all its phases, and pointing out to whom we may attribute the introduction of this new style, and the various steps by which we arrived at its transition in the sixteenth century. Now, we must recollect what had led to this. The whole of the Continent had been in commotion for a century previous, not merely politically, but in a certain artistic and literary sense, in consequence of the Greeks having been driven out of Constantinople and having taken refuge in Italy. The study of classic literature was revived through them, and began to resume its great dimensions and proportions, for it had been altogether lost. When it was reverted to again, it naturally induced the study of architecture and of sculpture of the Classic period, and of pictorial representations few only however, of which then remained, as in the Baths of Titus; and it was this that led the Italian mind into a new train of ideas, weary with the incongruous buildings of the pseudo-Gothic stamp in that country. These were most barbaric productions: mixtures of all kinds of sentiment borrowed from the North, and from Germany especially; the incongruous remnants of old buildings, put together as chance might direct, and without any rule of art; producing masses of buildings of a certain imposing size, with occasional graceful chance-combinations, but, as works of art, incomplete—I say, dissatisfied with this state of things, the Italians wanted to have some fixed laws of art, which should do away with these incongruities and these jarring principles of design, which should elevate art upon the same principles as classic literature, based on coherent forms and well understood principles. Such was the case upon the Continent, the Italian mind being then very vigorous and powerful—in fact, I may say the Italians at that period were the first nation in the world—in Europe certainly. They were brilliant in their imagination, eloquent with all the burning emphasis of a most impassioned language; they were enthusiastic in all they undertook, regardless of personal consequences; imbued with a deep love of the arts, pictorial and musical; they were inspired, for they had a natural rich store of invention and originality of ideas, not without deep and erudite investigation of the secrets of nature and the more obvious beauties of the animal and vegetable world; devoting their lives to the pursuits they followed. Such were the people who took the lead throughout all Europe, and therefore all Europe naturally followed them. The other European peoples were not endowed to the same extent with the same qualities; they were not possessed of the like rare faculties; and, therefore, feeling the influence of such superior minds, they instinctively yielded to their impulse. Now, England could not stand alone; she must be actuated by like feelings, and naturally enough she followed in the wake. We know the intimate relations which existed between Francis I. and Henry VIII., and the influence which the French King had in those days upon ours, and of which the interview on the Field of Gold between the two monarchs at Calais is a proof. It appears to me, therefore, that it was impossible, altogether impossible, for England to remain behind the nations of the Continent, retaining its mediæval propensities and preferences; but it was obliged to adopt the new taste prevalent throughout Europe. Now it is the investigation of that and of the process of the teaching of the English mind for the introduction of that new class of art, which Mr. Digby Wyatt has sought to bring before us. We know that in our Universities Erasmus, Bucer, and other intelligent foreigners were induced to come here to teach the classic languages and the philosophy of the Continent. In like manner, for the promotion of art, Holbein was brought over with the able artists, who have been mentioned by Mr. Digby Wyatt in his able paper, and whose various works have been described to us with so much discrimination as to their relative merits. I think, therefore, that it is extremely instructive to us that our friend should have pursued the subject so far, and should have investigated what was hitherto to a certain degree quite a mystery and an unknown subject, I believe, to nearly all of us—at least I myself was not aware of the minute history of the art of that period. We knew that Holbein came over here and influenced the arts of this country; and in regard to architecture we have an instance near us at Hampton Court of the graceful architecture he had introduced. We knew he erected a gateway at Whitehall; but how these and other pictorial influences came to bear upon architecture we could hardly see or understand. Now I was alluding to the power of the Italian mind; and our attention has been drawn by Mr. Digby Wyatt to the circumstance that Leonardo da Vinci, Holbein, and Albert Durer had impressed upon the men of the period the necessity of the study of mathematics and of the mastery of drawing the human figure. These were the two grand elements upon which all art should be founded, and they were themselves very eminent in possessing these great acquirements. There was this misfortune, however, that painters did not satisfy themselves with being painters; sculptors were not content with being sculptors; nor were architects always satisfied with being architects alone; but they mixed up and practised other arts, as we know by the productions of the various artists alluded to by Mr. Wyatt in his paper. That was a misfortune. I think that architecture particularly has suffered by the innovations introduced by painters and sculptors; and in this respect it seems to me no greater injury was ever done to our art than by Michael Angelo himself and by Bernini. They destroyed the purity of taste, introducing capricious varieties and all sorts of distortions and contortions in architecture, by which it was degraded materially. It is only men like Alberti, Vignola, Palladio and others, purely architects, who have vindicated architecture as an art independently of all others. We can perceive with respect to our buildings of the early period of the reformation of art that they were very much influenced by not being undertaken by architects alone but by painters. We see at Fontainebleau that the Italians, who came there not as architects but as painters, introduced every caprice they could think of, and produced a great medley; and although some good picturesque groupings were realized, to say that it is good architecture is not the fact.

Now, I hope Mr. Digby Wyatt will pardon me if I attempt to follow out the architecture of that period in illustration of our subject by one particular instance, and that is in a building at Liveden, Northamptonshire, of which there is a plan and a perspective view on the wall, taken by myself years ago. I will read an extract from a letter from Mr. Selby, a gentleman who lives in the neighbourhood, that is at Pilton near Oundle in Northamptonshire, and is well acquainted with the traditionary history of that building.

"The building was erected, or perhaps I should say commenced, by Sir Thomas Tresham, who was knighted by Queen Elizabeth at Kenilworth Castle in his eighteenth year. This gentleman, who appears to have travelled in Italy and to have been an architect of very great taste, built several other houses, &c., in the county of Northampton, viz., the Hall at Rushton, and a triangular entrance lodge, a beautiful work (both these are near to Rothwell). The house now belongs to Clarke Thornhill, Esq. He also placed a rich screen in the church of Geddington. Another specimen of his skill, the market house in the old town just spoken of (Rothwell), is still remaining but shamefully neglected. There is a print of this in Baker's 'County History.' It was commenced in 1577, and appears to have been taken down and rebuilt in an open space near the church. It is two stories high, and to each story there is an order, the lower one being Doric with an inscription in the frieze, and the upper one Ionic with panels containing coats of arms on shields. There are semicircular openings below, and above are the usual Elizabethan windows with mullions and transoms at mid height. It was preserved from absolute destruction by purchase from the surplus of a fund raised in 1827 by a few individuals." (*Baker.*) Liveden itself," Mr. Selby continues to say, "was most likely never finished with a roof, although the naked floors were laid and continued in the building, then going to ruin, until the Parliamentary wars, when they were cut out by Major Butler, who had the command of some troops on that side, and conveyed to Oundle and re-used, as stated by Bridges in his history of the county."

Now this Liveden, gentlemen, as you see, is in the form of a Greek cross, and it has central pavilions at the end of the arms. There is a kind of podium base, and the sur-base is quite a Gothic moulding. The die of the podium consists of a range of panels with shields in them, and occasional apertures for windows; then above that rises a Doric order, not of columns but of plain walls, but there is a frieze and cornice with triglyphs constituting the first order: then above that is, I suppose, an Ionic cornice, the frieze of which bears an inscription, some of the letters of which still remain and may be seen upon the view exhibited on the wall. The detail of the podium is also shown in a small sketch which I took at the time I visited it. Now my informant goes on to say:—

"Old Liveden was another fine mansion of the family of Tresham, and stood about one-third of a mile from what is called locally the 'new build.' There were two very handsome gateways to the old house. One was long since removed (destroyed) and the other was removed about ten years since and re-erected at Farmingwood's Hall (Lord Lyfden's seat). There is a fair copper-plate engraving of the 'old build,' as it is called, in a work styled 'The Antiquarian Itinerary,' published from 1815 to 1818, in the seventh volume. It is there spoken of under the title of 'leaden old Beel,' which with the whole of the letter-press descriptions of it is a tissue of error. There is no account of the Livedens in Baker's 'County History,' as all this side of the county unfortunately escaped his attention, whilst his power and means remained." So far Mr. Selby.

I wish to call your attention to this as a beautiful instance of the Renaissance, quite equal to anything to be found in France and Italy. If we had some artists, or if the Government would take up the work, as is done in France, and send competent draughtsmen through the country, and instead of making a collection of higgledy-piggledy bric-a-brac things, like many authors put together in their books; if the pure only was to be chosen, then we should find that this country produced fine works of art, and that that period was one, which might be imitated in its spirit with great success at the present time. It is very desirable for us that art should be vindicated from the great trash, which has been published as indicative of that period. My own idea is this, that as we had then but few competent architects and artists, the builders or masons who were employed made designs, which they had not the capacity properly to conceive; they made buildings of a certain size with particular feelings and sentiments of Renaissance, but they were carried out without true taste; and it is under the obloquy of these buildings, that we now suffer as to the reputation of that style. I would also call attention in that period to the sepulchral monuments, such quantities of which exist even in the churches of the metropolis. There are some beautiful compositions of this kind in Westminster Abbey, and also in the church of St. Saviour, Southwark, and Ashbourne in Staffordshire; but throughout the whole country you will find monuments in the churches of exquisite design, great simplicity of taste, and beauty of invention. Immense sums of money were expended upon them both in regard to the materials of which they were composed, the alabaster and various marbles that were employed, and to the workmanship. Certainly they are very fine productions, and ought not to be allowed to pass away, nor to be so unknown generally as they are at present, and their value ought to be fully estimated. I trust, Sir, the length of these remarks will be pardoned, but I was anxious to vindicate our country in this phase of its art history.

Mr. T. Morris, Associate: Mr. Digby Wyatt's paper was unquestionably a charming one to listen to, and it is a charming paper to read now that it has been printed. Knowledge often seems to be in the possession, if I may so say, of the wrong man, and before it can be made fully useful must be directed into new channels. In this way I think Mr. Wyatt has done us very great service by going into antiquarian fields, and bringing into the range of architectural literature a great deal of very interesting and useful information. With regard to his notion of decrepitude, I must, however, say that according to my feeling in the matter Gothic architecture never decrepitated at all. The first-pointed possessed the vigour and grandeur of the style, and the third-pointed was more elegant, mature, and finished, but there was no sign of decrepitude about it. It may be too much to ask Mr. Wyatt to modify his opinion by mine; I simply state my own. So far as foreign artists are concerned, I think we must always attribute a great deal to them. If the parts of our chief buildings—the adornments, ornaments, sculptures—are compared with those of the Continent, we find great similarity of treatment. During the early ages of art in this country and the existence of freemasonry, the introduction of foreign artists was probably continuous: but while the Church remained triumphant and unassailed, everything like individual distinction subsided. It was the Church, and Church alone. But when dissensions with the State began, as we find especially expressed in the antagonism between the Duke of Gloucester and Cardinal Beaufort, a great change ensued. Two years after the accession of Henry VI. the Masonic lodges were dissolved, and the great blow to Gothic architecture (then in its most perfect state) was given. But as to the introduction of foreign artists, it may be well to recollect our early regal ties with France, the early unity of our Church with that of Italy, our early artistic and political intercourse with the Netherlands, and though not so fully recognized as it ought to have been, the effect on art of those matches and relationships of the Tudor dynasty which caused great intimacy between this country and Spain for a long series of years. We had, indeed, for ages been brought into constant communication with all the artistic nations of Europe, and the patronage of foreign artists would appear to have been continued rather than originated by the Tudors. I conceive that we owe to the artists so patronized more by way of modification in the old outgoing system than of direct reformation. As to the introduction of a revived classical taste into this country, it was impossible that we could receive it from Italy until it had been well advanced there and made popular by Palladio; but whatever the previous effect of foreign talent in this country may have been, we were certainly much indebted to two Englishmen—Shute, who was first upon the scene of the revival, and Inigo Jones, who went twice to Italy, and who studied the works of Palladio with much success. Jones practised in something like the Elizabethan style at first, and finished with that of the banquetting-house at Whitehall.

Professor KERR, Fellow.—I think we have scarcely recognised as we ought to do the remarks of Mr. Robins, which seem to me to afford a very good illustration of a bad kind of criticism, very common now-a-days. An accomplished gentleman, like Mr. Digby Wyatt, comes before us and reads a communication, which, like himself, is brimful of knowledge, and another gentleman takes leave to criticise it in what is, I hope I may say, without being at all offensive, the least elevated style of criticism that can be adopted in such circumstances. The first question submitted to us by Mr. Robins was whether Mr. Digby Wyatt had not said something disrespectful of Gothic architecture. This is the invariable opening cry raised by a certain sort of persons now-a-days whenever any subject of high-class critical bearing is mooted. Having thus begun, Mr. Robins next proceeded to deal with the critical question on its merits, and again he adopted the ordinary manner of the moment—that is to say, he took the fashionable sentimental view of the question. I may be permitted to say that I am certainly surprised to find a gentleman of Mr. Robins' practical and sensible position in the profession quoting such a writer as Mr. Ruskin against the arguments of Mr. Digby Wyatt. What we have had so often laid before us we have had repeated once more to-night—that in the Middle Ages architecture flourished in consequence of the enthusiastic sentimentality in the people at large. I, for one, never could see anything but the greatest absurdity in such an idea. I believe that the merits of Gothic architecture, often great and often small, were in these old times altogether unconnected with such sentimentality in any shape. There may have been something of the kind amongst some of the clergy, and there may have been an enthusiastic religious feeling, more or less general, amongst some of the laity, according to occasional circumstances; but as for there being anything like a continuous romanticism in the heart of the people at large, of such a kind and of such intensity as to exhibit itself in the details of architectural design, I can only say that I think there cannot by any possibility be a greater fallacy propounded, or anything more subversive of the true principles of artistic criticism. I am anxious that Mr. Robins should not think that I am opposing him too severely, but it is seldom that we have this particular argument of his laid before us in a way so favourable for its refutation. Having, then, fallaciously appealed to our sense of respect for Gothic architecture through our supposed veneration for the imaginary sentimentalism of the Middle Ages, Mr. Robins next proceeded to exhibit another kind of error, which is too prevalent at the present time. He introduced as the great cause of architectural change an individual ruler in the State. Now, no such individual ruler has ever in the history of architecture, as a matter of fact, exercised any such influence in a practical way. In the present instance he assumes that King Henry VIII. was the individual cause of a certain change of architectural style; and then, to prove the character of that change, he holds up to us the character of the king in his private capacity! King Henry VIII. married six wives; but if, instead of six, the number had been sixty, such a circumstance can have had no influence upon architecture. On the contrary, if this king exercised any influence at all upon art, it would be in the capacity of one who was a most accomplished and learned man. Indeed, in this view of the case he was a man who did a great deal for this country, a man whose true position in the intellectual progress of England, as apart from his errors of private life, is now beginning to be more rationally recognised. Certainly, as regards literature and the arts, he was one of the most accomplished men in Europe; and as such we may no doubt believe that he took a certain amount of interest in what was then the object of accomplishment and learning—namely, the spread of the new school of intellect, which took its rise in Italy as the cradle of the modern world. Mr. Digby Wyatt and Professor Donaldson have taken much higher ground than Mr. Robins. They come before us to illustrate a very important period of architectural history in this country, and they do it by means of the resources of learning, by the elaborate collection of facts, and by the deduction of sensible conclusions. Having pointed this out, I have fulfilled the object for which I rose—namely, to object to a mode of argument which, although adopted I dare say by Mr. Robins to-night with the best intentions, is really unfair towards such a critic as Mr. Digby Wyatt.

Mr. C. F. HAYWARD, F.S.A., Fellow.—I quite feel the force of what Professor Kerr has said, in vindication of the learned paper which we are discussing, and as to the object of Mr. Wyatt in bringing this subject forward—viz., to illustrate the rise of a particular phase of art. We can well understand that though one may have the greatest love for Greek or Gothic architecture, one may not feel any the less able or willing to trace out to the utmost extent any other style of art such as that which we are considering this evening. I had occasion at one time to take especial interest in the works of this period—the first quarter of the sixteenth century—having set myself to measure and examine a building which illustrated it for the purposes of a paper for the Essex Archæological Society, and I was greatly indebted to Mr. Digby Wyatt for some hints which he gave me at that time. The building I refer to is Layer Marney "Tower," as it is locally called; and it is one to which I should wish to call attention on this occasion, because, as it is rather out of the way (about five miles from Colchester), it may not be often visited; although it is well deserving of attention, and illustrates most clearly the introduction of this particular phase of Italian Renaissance architecture engrafted upon the latest Tudor Gothic. Since that time I have been particularly struck with another building of about the same, or indeed rather later date, but which, so far as I have been able to see from a cursory inspection, does not illustrate any of this foreign introduction in any of its general forms or details, although it is carried out entirely in the same material—brick, with terra-cotta dressings and ornaments. I am speaking of the magnificent house called Sutton Place, situated between Woking and Guildford, in Surrey, which was erected by Sir Richard Weston, at the commencement of the second quarter of the sixteenth century—viz., in 1529—at least, this is said to be the date of the grant of the estate by Henry VIII. to Weston, whose rebus (R. W. and a tun) is to be seen everywhere on the building. Although the principal entrance front has been destroyed, there still remains a large amount of terra-cotta and red moulded brick ornament, without, so far as I know at present, any trace of this classicality which we are considering, but the forms generally show remarkably good late Tudor work. This would rather lead me to correct a notion that I once had that almost all the really good terra-cotta work, and it seems to have been very prevalent at this period, was from the designs of foreign artists, if not their actual handywork. Such an example as this I have quoted, as well as others of which I am now reminded by Mr. Wyatt, would correct any idea of that kind, because it is impossible to suppose that foreign artists, chiefly Italians, who worked at home entirely with classic features, such as appear at Layer Marney,—(pilasters adorned with delicate arabesques, used as mullions, and dolphins for crestings,)—should over here be able or willing to work in our Gothic style, which was then dying out. At any rate, the man who moulded the terra-cotta work in the one building I have noticed must have been a different individual and must have had an altogether different training from the other. Both houses, I believe, were erected about the same time, and in the same manner and character of building in all respects but these details. The one in Essex was never finished, but was stopped at the death of Lord Marney, in 1525; whereas the other was entirely completed. In the chancel of Arundel Church are some magnificent terra-cotta tombs of Earls of Arundel, who died 1524 and 1544, which, if I understand rightly, show unmistakeably the hand of Italian artists. Those would compare very well with a tomb in terra-cotta work which exists in the church of Layer Marney, close to the house of which I have spoken. Perhaps I may be excused in drawing attention to these as examples of study illustrative of this valuable and careful contribution by Mr. Digby Wyatt to the history of the period.*

Mr. THOMSON, Fellow.—Some remarks having been made by Mr. Hayward on the subject of Sutton Place, I may say that I have seen that building, and I have heard its history related by the family now residing there, showing why it was carried out in moulded brick. It is related as a legend that the monarch of the day gave permission to the party (Sir Richard Weston) to build at his (Henry VIIIth's) cost a house of such quality as he could complete within a given time (one year), and that such condition led to the introduction of the moulded work being done in terra-cotta.

Mr. DIGBY WYATT, in reply, said; If you will allow me I will begin by very briefly saying a word or two in reply to the remarks of the different gentlemen who have addressed us this evening upon matters of detail, leaving the broader question raised by Mr. Robins to the last. We are indebted to Mr. Gordon Hills for the reference he has made to the family of the Bernardi. I think we have little or no reason to mourn over the destruction of the paintings by the falling of the spire of Chichester Cathedral, to which Mr. Hills has referred; inasmuch as in reality they had been previously destroyed, for they had been so painted over that scarcely any trace of the hand of the elder Bernardi at least was left in them. But there is one painting which corresponds very closely with the portraits by Bernardi included in the series at Chichester, and which is in the possession of my wife's family: It is perfectly intact, and from it one may see that while Bernardi possessed the power of seizing a likeness very strongly, he was an artist gifted with a comparatively inferior power of execution. There was nothing in the paintings in Chichester Cathedral which can make one regret their destruction. With regard to Stevens the Dutchman, I did not mention him because he only came to this country about the end of the century, and the works that we know of his were probably done in the beginning of the ensuing century; and, moreover, they were only paintings, and involved but little power of design. He is a man whom I rather passed over intentionally. What Mr. Hayward has said on the subject of terra-cotta is very interesting, because no one will assume for a moment that the Italians were the originators of terra-cotta in this country. The process of terra-cotta which they were originators of here, was the terra-cotta invetriata, or covered with a stanniferous glaze and susceptible of receiving colour at will. Before their time it is true there were in this country green encaustic tiles, made in rude pottery, very much inferior to that introduced by the Italians in the time of Henry VIII. The coating with a white glaze and then colouring upon that was decidedly an Italian process, which they appear to have brought to England. If we look over the catalogue of Henry VIII. we find "pictures of erthe," as they are called, which, if not executed by the Italians here, were at least brought with them, and were scarcely to be distinguished from the native Italian terra-cotta work. That terra-cottas were used by Italians here there can be very little doubt, because not only were they introduced at Hampton Court and fully described in the catalogue referred to as in Henry VIIIth's possession, but that which I have engraved from St. Donat's Castle is clearly Italian work altogether. Thus, although one is fully aware that there was plenty of terra-cotta, as at East Barsham, &c., before the time of Henry VIIIth's Italians, yet that they introduced a popular style of terra-cotta work in England I think is clear. Having touched upon these points of detail, I now come to the more general principles which Mr. Robins has commented upon. That he should have commented upon them as he has I take to be a great compliment, because if you make a great effort and distinctly state facts which you believe have some little novelty for your audience, and yet find they do not provoke any antagonism, it may be pretty well inferred that there is little force in them; and that they will scarcely induce that whole "progression by antagonism" with which Lord Lindsay has made us familiar. Although Mr. Robins has been ably dealt with by Professor Kerr, I yet feel that a few words are requisite from me, as the author of the paper inculpated. In the first place, it is to be clearly understood that because I may commend one style, and point out certain particular excellences in it, I am not an advocate of one set of principles only, or that I recognize truth, justice, and excellence in one form only either of "faith" or "works." It is in the nature of the estimate of cosmopolitan principles that a true artist should be read. He must show himself discriminative as well as liberal—practical as well as enthusiastic and poetical. It is perfectly true, on the one hand, that one of the highest forms of art is the ideal; but because that is so it is no reason why we are to insist upon the limitation of the external forms of all art to those conventional types which, transcending what is natural, can fully embody the Ideal. When we look at the beautiful productions of Gothic architecture, painting, and sculpture, they frequently inspire that sort of sentiment which reflects very often pure devotional feelings. At the same time, because we admire that, are we to say that no country is to go on in the study of anatomical, geometrical, or mathematical laws, and their application to the establishment of other types of art? To do so would be to neglect adding all the graces that science may bring to art altogether. It is one of the strongest points in all successful art to observe the essentially practical and technical basis upon which the artist must build, and by means of his command over which he can alone clothe his conceptions with fitting form. It frequently occurs that a great artist sets up the type of a certain form of pure beauty. It is admired, repeated, and adopted as the vernacular of his contemporaries, who while aiming at reproduction involuntarily modify it. By this common spontaneous system of progress those who at first admired ultimately get down, as it were, to a blunted sense in the enjoyment of it; and the type gradually becomes effete. So it is that decrepitude often affects styles which, beginning in purity, are not, as it were, fed on or refreshed by change resulting from the association of fresh external elements with those upon which the great artist first created his ideal type. In my paper I took great care to distinguish between the falling-off in the fifteenth century in the art portion of architecture and its technical part. I stated that there was never a period in Gothic architecture when the technical branches of masonry, in vaulting and interpenetration especially, attained to greater excellence. There were first-rate masons in every part of the land. The conception of a building like King's College, Cambridge, was one of the grandest in all the country; but I doubt whether any good judge of art, comparing a bay of its length with a corresponding bay from Lincoln, Salisbury, or Westminster, would not at once realize how great a falling-off had taken place in the science of proportion, and the just conception of a general harmony of parts. Who, examining carefully the sections of the mouldings, the forms of the different complements which make up the whole architecture of Henry VIIth's chapel, would be found to say that they are one-half as good as corresponding features taken from good models even of middle pointed work? Hence I say, and I think with propriety, that had the fifteenth century system gone on, by spontaneous combustion alone, its "decrepitude" would have merged into "senility." Change, with consequent novelty, by an unerring cycle of revolving wants and supplies, was absolutely demanded in this country to enable it to keep pace with contemporary revolutions abroad; and had that change and novelty been arbitrarily withheld I believe it would have been certainly fatal to national art. In its earliest architecture, after the creation of the first pointed style, we recognize the greatest ideal excellence in England. In the reigns of the first two Edwards you find the parts, though still graceful, beginning to assume a certain amount of rigidity, and departing from the excellence which characterized the early English work. Then you go on to the mannered work of Edward III., and to the still greater mannerism of the perpendicular styles; so that, instead of following a ratio of progress, the onward march is in a scale of regular and uninterrupted declension; I feel, therefore, that I am perfectly justified in saying that under the "wars of the Roses" architecture was in a fair state of decrepitude, because it had fallen, step by step, from earlier excellence to actual feebleness. That is clearly shown by the falling-off in the spiritual forms of old religious art, with little but mannerism to take its place—by the want of power to draw the human figure or to understand perspective, and the deficiency in knowledge of classical literature,—in fact, the country had been declining in intelligence and intellectual activity—a certain advance in the forms of poetical expression being perhaps excepted—for at least a century. There had been a long series of wars, and the whole land was in a feeble and exhausted state, and unless we had had Henry VIII., with an active, full-blooded, strong constitution, young and with a fresh set of sympathies, I believe the country would have gone on dropping and dropping, and, as far as architecture was concerned, would have come almost to a state of annihilation. If we had remained in ignorance of such men as Michael Angelo, Titian, Leonardo da Vinci, Raffaelle, whose power no critic has been able to impugn satisfactorily, I think that we should in point of art have developed downwards till we had reached insignificance. I consider, therefore, that we are greatly indebted to Henry VIII. for what he did in this respect, and indeed in many others. There is one other point in which a little confusion of ideas seemed to prevail in Mr. Robins's mind. He appears to think that beautiful productions in art must necessarily be the productions of men of beautiful lives. That is entirely a mistake. Whoever is acquainted with the literature of the Greeks, or the Renaissance, or mediæval literature, will find that at the very time the concretions, which we call embodiments of beauty, were given to the world, the men by whom they were produced were frequently given up to indulgence of vices and evil passions, and even refinements of sin and crime were rife. It cannot, therefore, be said that one period, whatever its art may have been, was much more virtuous than another. The great distinction I believe to be this, that generally speaking the individual may be what he likes; it is general voluptuousness in a country which is apt to produce degeneration in art. You may go as far as that, but to go further is, I think, unsound. In conclusion, allow me to thank you for the patience with which you have listened to me, and believe me that in collecting these materials my object has been solely to put certain facts together and to lay them before you, without claiming merits for reformers simply because they were modifiers of pre-existing conditions of art. It is for you to make such deductions from the facts I lay before you as you may see fit. Believe me I desire to do injustice to no style of art nor set of artists, be they Goths or be they Greeks.

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* Layer Marney Hall is further described in a small pamphlet, illustrated with special engravings, and some kindly lent by Mr. Parker. Sutton Place is shown by a view in the "Bibliotheca Topographica Britannica, vol. II, Antiquities." The date of the grant is there given as 1521. "Aubry's Antiquities of Surrey" say the year before. All the Local Histories give views and statements following these two authorities, and the "Gentleman's Magazine" describes it in 1789, and again in 1834. In "Nash's Mansions" are two plates devoted to the exterior of Sutton Place.

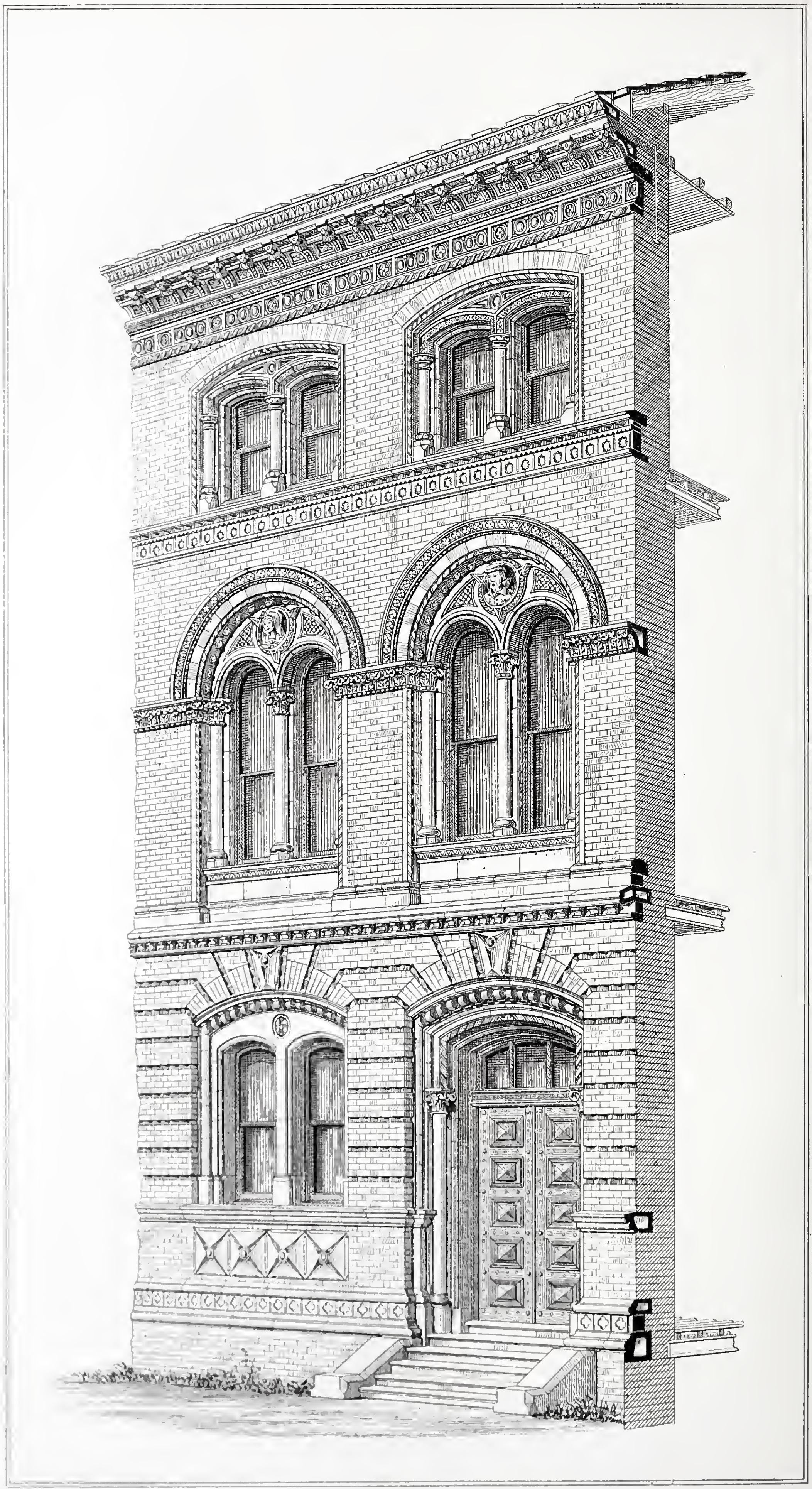
The CHAIRMAN.—I think we shall all be willing to accord Mr. Digby Wyatt a twofold vote of thanks. We thanked him on the last occasion for the admirable paper which he then laid before us, and now I think we owe him an acknowledgment for the additional information with which he has favoured us. In proposing this vote, I will only make one remark, which has occurred to me during the discussion. He has led us into the consideration of a subject of the most interesting kind, and one that is new to most, if not to all, of us. He has very fully described the character of art in the period of which he treats, but the examples he has placed before us are hardly architectural examples. He has only mentioned the Palace of Nonsuch; other examples have been referred to by the various speakers, and are more or less apposite. The development of art which he has described to us has been in the decorations, the less important minutiæ, monuments, arabesques, enamels, mosaics, inlays, and so on, rather than the conceptions of architects in buildings. Unfortunately, there were no architects worth mentioning. I am going, Gentlemen, to make a suggestion to Mr. Wyatt, which I am sure no one will take more readily than himself, and that is this: He is an able architect, as we all know; he has pursued the subject of this evening in a particular line, that of the details of works illustrating art, rather than in the larger masses of building; and he has just told us that there were no architects in those days worthy of the name. Now, I think it would be a pity, and rather against the principles he wishes to lay down, if that were really true. If foreign art exercised this great effect upon English taste, I think it ought to show itself in architecture, as well as in other forms of art. We have not had any examples of that kind mentioned by Mr. Wyatt, except Nonsuch, which I do not think he or we can admire very much. I would venture, therefore, to suggest to him that he should give us still another opportunity of thanking him by bringing his extraordinary power of research to bear in finding, or at least in attempting to find, some examples of architectural art, properly so called, illustrative of the principles which he has been laying down. I cannot quite bring myself to believe that they do not exist. I now propose that we give our best thanks to Mr. Digby Wyatt, and I am quite sure it will be carried unanimously.

Professor DONALDSON.—I think we might compare Nonsuch, mentioned by Mr. Digby Wyatt, with the Château de Madrid, which once existed in the neighbourhood of Paris, and was erected about the same period; it was a remarkable instance of the beautiful introduction of all the arts combined. I would call attention to the enamelled slabs which formed part of its decorations, and are preserved in the Hôtel de Cluny, at Paris. Each subject consists of two slabs, about three feet square, making on their entire height beautiful pictures six feet in height by three feet wide. They are well worthy the notice of painters and architects.

The resolution of thanks having been passed with unanimity—

Mr. DIGBY WYATT said: With reference to the invitation of our Chairman, I may say that in preparing this paper I did look as closely as I could in all directions to find any work of an architectural nature done by these foreigners, but, as I have already stated, I could find none other than those to which I have alluded. You must remember that rapid as the communication of change is in ideas, the creation of monuments in a new style is a slow operation. The dawn of change is always shown in small things. If you would look to the first elements of any transmutation, you will find them in trifles long before they can appear on a large scale; and thus it is that I have been obliged to trace out and dwell upon small things, in order to illustrate the dawn of change in great. So far as I know, therefore, there exist no buildings, executed in the Italian style by foreigners in England during the sixteenth century, to illustrate. It would be well to remember that the great reformers really had been the printing-press and the art of engraving. Even before the year 1500 we had had upwards of 100 books published in this country; whilst on the Continent the works of some of the greatest printers had been published, many with woodcuts, and with arabesque decorations. I will add no more, but refer you to the "Hypnerotomachia" of Poliphilus, with Andrea Mantegna's woodcuts, as an illustration of certain forms in which the principles of ancient art were asserted with great and remarkable purity, and consistency of style. That such books were circulated to a small extent, and did change men's minds gradually, is certain; but it was a long time before architecture, in England at least, to any extent answered to this change. I have mentioned that in the year 1550 John Shute was sent to Italy by the Duke of Northumberland, and on his return published a text-book, ultimately superseded by "Serly his rules." A number of other Englishmen shortly afterwards entered the field, and the style of structures subsequently erected really became national; but it was the Italians and other foreigners to whom I have alluded who sowed the seed, and Henry VIII. who watered it, in English soil.

The discussion having thus been brought to a close, the proceedings then terminated, and the meeting adjourned to the 22nd of June.

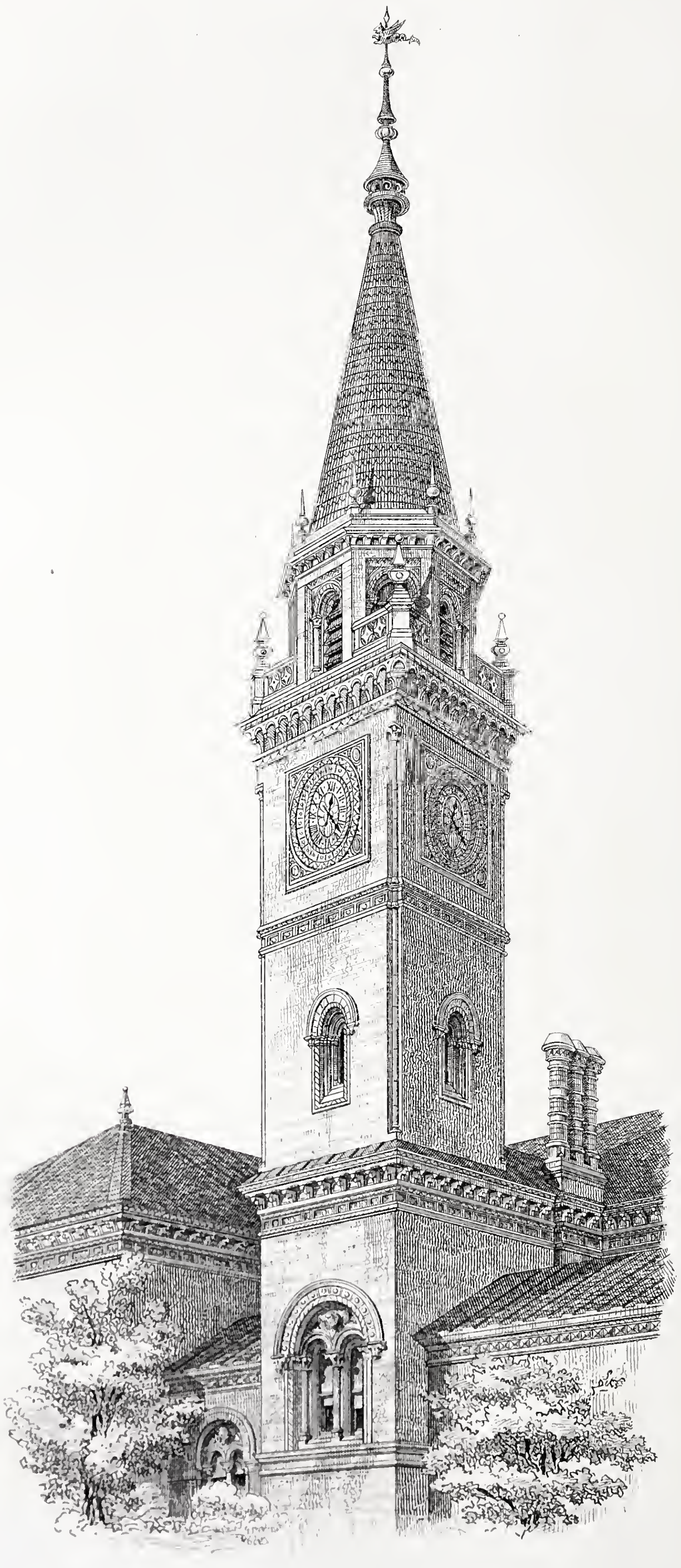


Charles Barry Archt

Kell Bros Lith Castle St Holborn

NEW ALLEYN'S COLLEGE, DULWICH.

ELEVATION & SECTION OF ONE BAY OF THE FACADES
OF NORTH & SOUTH WINGS.



Charles Barry Archt

Kell Bros Lith. Castle St Holborn

NEW ALLEYN'S COLLEGE, DULWICH.

VIEW OF THE CLOCK TOWER.

1, Westminster Chambers,
Victoria Street, Westminster.
S. W.

14 Aug 1868

Gent:

By Book post I send you the finally corrected proof of the Terra Cotta paper. I have found a good many typographical errors as you will see.

It will not be necessary to send me any more proofs. but I will thank you to forward me 50 copies for my own use when made up complete.

Yours obediently
Charles Barry

Messrs Day.

Royal Institute of British Architects.

At the Ordinary General Meeting, held on Monday, 22nd June, 1868, Joseph Clarke, V.P., in the Chair, the following Paper was read:—

SOME DESCRIPTIVE MEMORANDA ON THE WORKS EXECUTED IN TERRA COTTA AT NEW ALLEYN'S COLLEGE, DULWICH, BY MR. BLASHFIELD, OF STAMFORD, FROM THE DESIGNS AND UNDER THE SUPERINTENDANCE OF CHARLES BARRY, ARCHITECT.

By Charles Barry, Architect.

My excuse for proposing a subject for our consideration this evening which may appear to be too much identified with myself, and therefore somewhat egotistical, must be found in the special appeal made to all members of this Institute by our zealous Secretary, Mr. Seddon, at the beginning of the Session, that they would each give some practical description of the works in which they might happen to be engaged. I trust, therefore, I may reckon on your forbearance in speaking almost wholly to-night of the works at New Dulwich College, now approaching completion under my superintendance. It is no small comfort to an architect to be able to count on sympathy from his professional brethren in any work possessing some novelty which has of course greatly engrossed his thoughts, and in respect to which the opinions and suggestions of others as well and better qualified than himself may be of essential service.

It is, therefore, under the influence of these feelings that I have put together these notes descriptive of the application in the works of the new College of terra cotta, to the exclusion almost entirely of stone, and more completely than has, I believe, been done in any other buildings lately erected (not even excepting those at South Kensington).

I need make no apology for introducing the use of terra cotta, for strictly architectural purposes, to the consideration of the meeting; interest has been taken in its revival and use for architectural purposes in many directions of late years; and the fact that in this practically imperishable material we have preserved to us more completely than in any other the thoughts and works of artists from almost fabulous antiquity, through each successive age of the world, and in every country at any time civilised down to our present time, serves to show the immense field there is for intelligent enquiries into the use and advantages and the artistic employment of such a historic material.

I have, for instance, on the table a small statuette taken by Professor Marriette from the ruins of ancient Thebes, which is believed by him to be not less than 3300 years old, covered with hieroglyphics, its outlines and details being quite sharp and perfect. Mr. Layard records his discovery of bricks or blocks of terra cotta found in the ruins of Nineveh, with their arrises, indentations and makers' marks, plainly discernible, and I think the meeting will be led to think as I do, and have done for some years, that the subject of ancient brickwork and pottery work of a strictly architectural order has not for many years past received the consideration it deserves in this country. At the same time many able writers have dealt more or less completely with the subject, amongst whom are conspicuous the names of Piranesi, Luigi, Rossini, Britton, Knapp, Waring and Macquoid, Richardson, Scott, and last not least, Professor Grüner, in the beautiful and interesting work on the Brick Architecture of North Italy, recently published by Mr. Murray. There are many other writers who treat of terra cotta and potter's ware as applied to vases, statues and small articles, and I have thought it might be useful to those who may wish to pursue with more leisure the subject which I have started to-night, to append to this paper a list of writers on this material and its application.

That list begins not unnaturally with the oldest book in the world—I mean the Bible, where we read in the 11th Chapter of the Book of Genesis the significant words—" Come let us make bricks and burn them thoroughly, and they had *brick for stone*;" and the Book of Exodus tells us of the hard bondage enforced on the Israelites in the making of brick. Sir Charles Lyell, in his work " The Antiquity of Man," puts the matter in more eloquent language than I can suggest. He says in his 3rd Chapter:

" In the vast changes this planet has undergone few things remain to mark the arts of its earlier " inhabitants. Flints, spear heads, arrow heads, fragments of iron, of bronze, and of pottery are almost " all that remain. Of the latter—burnt bricks, jars, vases, the human figure in burnt clay,—are found in " the remains of submerged towns, in the channels of the Nile and in Upper Egypt, in the Mexican buried " ruins of America and elsewhere, as the enduring types of civilization of peoples and races whose names " even are not known in the pages of history. Granite disintegrates and crumbles into particles of mica " quartz and felspar. Marble soon moulders into dust of carbonate of lime, but hard well-burnt clay " endures for ever in the antient landmarks of mankind."

All nations whose early history is known—Egyptians, Greeks, Romans, Gauls—have left us records of their thoughts in terra cotta, as well as in other materials which are usually deemed of a more noble character, thus showing that its importance has never been entirely lost sight of; and coming down to more recent times, we have its use and facility of application exemplified in the numerous buildings of Italy, particularly North Italy, with a beauty and artistic fancy which must, I think, satisfy the most fastidious artistic taste. As regards its use in smaller articles, we all know how every museum in Europe abounds with specimens of vases, amphoræ, lamps, relievi, statuettes, altars, antifixæ, mouldings, &c. Egypt, Greece, Italy, India, America, all furnish these. The vases found at Cuma and Vulci especially have never been equalled for elegance of form and beauty of workmanship. I can well remember when (now, I am sorry to say, more than twenty years ago), before the work. the struggles and responsibilities of professional life had begun for me, I studied and admired the brick and terra cotta buildings of Milan, Florence, Verona, Vicenza, Pavia, Sienna, and other old towns of North Italy, and I resolved that, if ever opportunity should offer, I would endeavour to use the material in England with so much of the old spirit as my powers would enable me to realise.

Terra cotta, as my audience know, is a term usually applied to artistic works made of coarse clay or a ruder material than that used for fine earthenware or porcelain; it is generally of red or buff colour, but will take other tints by chemical aid. Some specimens are on the table, and architects will readily appreciate the opportunity thus afforded of decorating in colour their works, in accordance with their own taste, with a material that shall endure as long as the fabric itself, with which their names are to be identified. As terra cotta also admits of being glazed, a further opportunity for architectural decoration is presented for use.

The first employment of burnt clay was probably for articles of domestic use; and the knowledge obtained in making water bottles would soon lead to its use for the making of bricks, tiles, and other articles. The mounds of Nineveh and Babylon contain bricks with inscriptions more neatly made and of larger size than those in present use. Many of the bricks found by Mr. Layard were enamelled. The Egyptians made small figures of terra cotta covered with inscriptions, and having an enamel supposed to be silicate of copper. The finest terra cottas were probably executed about 400 years B.C., and the examples of this period, which are in the British Museum, testify to the durability of well-burnt clay. Probably some of the friezes, with mouldings and bas reliefs, in the Museum, are of much earlier date. Pliny, in his 35th book, gives a long chapter to the art of pottery, and mentions the names of many great sculptors who wrought statues in clay, and also the cities famous for pottery.

The knowledge in every description of pottery possessed by the Romans spread with their conquests, and Germany, Spain, Gaul and Britain retain fine examples of brickwork and tile and Mosaic floors. From the remains of Roman potteries met with in England, there can be little doubt that pottery was a most important manufacture here some sixteen centuries past. From Peterborough westward, along the valley of the Nene, remains of Roman potteries extend for several miles. At Castor, in Northamptonshire, a kiln and a quantity of potter's tools were discovered, also moulded arch and hypocaust bricks.

The people of Lombardy and other states in Italy, mentioned by Pliny as famous for pottery, seem always to have preserved the knowledge of making terra cotta for architectural purposes; and it is now in North Italy we find the most beautiful architectural terra cottas. The elaborate terra cotta enrichments of the new gallery at Milan, called The "Galleria Vittorio Emmanuele," have been well executed by *Boni*, of Milan, from the designs of Signor Mengoni, architect.

The enamelled terra cottas of Lucca della Robbia, in the 15th century, aided the introduction of the new style of ware called Raffaelle, which was brought to great perfection about the 16th century at Pesaro, Urbino, Gubbio, Faenza and Castel Durante. In the 16th century, Bernard Palissy painted tiles for walls and floors, and coated them with a thick enamel. Pottery was made at Majorca by the Moors about the 12th century; and the Moors, who became for a time masters of Spain, spread the knowledge of making ornamental and enamelled tiles; probably the Monks, who were the great conservators of the arts during several centuries, owed their knowledge of making encaustic tiles to the Moors. It is said that the Pisans introduced Moorish tiles for church decoration about the 12th century, at which time the making of terra cotta began to revive for architectural work in Italy.

From the time of the downfall of Roman power in England until about the 13th century, there are few evidences of brick being used in important buildings in England, except such bricks as were taken from the ruins of Roman works, as at St. Alban's Abbey and other places; and it does not appear that brick became again a favourite material for public works in this country until about the 14th or 15th century. The brickwork of Little Wenham Hall, Suffolk, is one of the earliest specimens: it is supposed to have been built about 1260.

The introduction of the Tudor style gave an impetus to the use of brick, moulded brick, and terra cotta ornaments. During the 15th and 16th centuries many large mansions were erected in England of brick, having moulded brick cornices and terra cotta ornaments. It is said that Trevigi and Holbein introduced moulded bricks and terra cotta towards the end of the Tudor period.

During the 17th and 18th centuries many choice pieces of brickwork were executed, and in many parts of London mouldings and cornices of this date still exist. Towards the close of the 17th century, the stone ware potteries of Staffordshire began to be established; and about the middle of the 18th century, plaster of Paris moulds began to be used by the Staffordshire manufacturers, and Wedgwood began his career in the making of terra cotta vases and other wares. About 1750 the manufacture of stone ware was making progress at Lambeth; and about 1790, works were established at this place for making terra cotta architectural details, statues and vases, by a lady of the name of Coade. These works occupied a large space of ground in Pedlârs' Acre, Lambeth, near to the wharf of Messrs. Eastwoods. They were first known as Coade's, then Coade and Sealey, then Croggons, and lastly as Routledge and Lucas. They were closed, on the retirement of Routledge and Lucas from them, about twenty years since, and the moulds, models, implements, &c. were sold by Messrs. Rushworth and Jarvis. The enterprise and good taste exhibited at these works were of the greatest value to the plastic arts. It is said Flaxman was employed on some of the models for these works, but it is certain that Bacon, Rossi, Babb, Panzetta, and other leading sculptors who ranked high in the profession at the commencement of the present century, were employed at Coade's. The terra cotta made at Coade's was of a warm stone colour, and its durability can be attested by very numerous specimens spread over England. The bas relief representing the death of Nelson, at Greenwich Hospital, was executed by Bacon at Coade's. The frieze, the capitals, the trophies, and statues in the older part of Buckingham Palace were made there, and although the stone work on all sides shews great signs of decay, and the portion last built has been painted several times, the terra cotta Corinthian capitals are as sharp as when they left the kiln.

Croggon, successor to Coade, had a show-room on the North side of the New-road, a little Eastward to Tottenham Court Road, and erected a terra cotta front, part of which may still be seen with the paint which was put upon it after he retired from the premises, pealing off the terra cotta, and leaving it fresh and clean.

About the commencement of the present century, other manufacturers began to establish themselves in competition with Coades, among whom was Van Spangen, a Dutchman, who established the firm of Van Spangen, Powell & Co., at Bow, about 1820. Van Spangen made ornamental moulded panels, keystones, rustic quoins, statues, tomb stones, &c. His works were broken up about forty years since, and a large number of his models and moulds were purchased by the late Mr. Felix Austen, of the New Road, who was then commencing the use of Portland cement, (first patented by Aspdin and Beverley, of Wakefield), combined with broken stone, pounded tile, and coarse sand, for forming what he termed artificial stone.

About this time also Rossi and Bubb, who had been employed at Coade's works, began to manufacture terra cotta for themselves. Rossi executed the large statutes, the antifixæ, the architrave enrichments and the capitals for St. Pancras Church, New Road. Bubb executed the bas-relief in front of the Opera house in the Haymarket, and many of the statues which ornament the terraces in Regent's Park. Mr. Bubb was unfortunate in his business, and Mr. Brown the Marble Mason, of University Street, took his premises and kiln, which are perhaps still in existence. Brown made a few terra cotta articles, but soon abandoned the business.

About 1815, Charles Carter, of Dean Street, Oxford Street, who was connected with Parker and Wyatt, the first makers of what is called Roman cement, made a few architectural ornaments in terra cotta, and also red incised tiles, and inlaid them with Roman cement to work with stone incised quarries inlaid with Roman cement. When Carter retired from his business, many of his things fell into the hands of Parker and Wyatt, and it was from seeing these suggestions of Carter's, as to floor and wall tiles, that led Blashfield (who had become connected with the house of Parker and Wyatt) to inlay tiles with cement, and to make his first experiments in mosaic pavements: this led to an acquaintance between him and Herbert Minton, and was the main origin of the sort of mosaic pavement or Minton's Tiles, which, beginning with him, are now so commonly manufactured and used.

In 1836, Sir Frederick Fowke, of Leicester, made some very good terra cotta vases, which were spoken of in a Parliamentary Report of this period.

In 1839, Blashfield employed Bubb to make experiments at Canford, for Sir John Guest, on Lord de Manley's clays, for making terra cotta for use in building model cottages, and a small quantity of moulded bricks, tiles and ornaments were made at that place, from sketches made by my father, and worked out in his office by myself. Bubb's health failing, Blashfield gave up the attempt to establish works in Dorsetshire, but continued to employ Bubb, who modelled a statue of Pomona for him for the late Sir William Middleton, of Shrubland Park, Norfolk.

About 1845, Herbert Minton executed copies of the Medici and Borghese vases, in buff terra cotta with a thin glaze, from moulds furnished by Blashfield. Messrs. Cubitt, the Builders, erected a kiln at their works in Gray's Inn Road, about this date, to make architectural terra cotta.

After the breaking up of Coade's works by Routledge and Lucas, several makers of terra cotta sprang up. Moulded bricks were made at Glasgow, Tunstall, Ewell, Ladyshare at Worcester, and other places. Mr. Pulham, of Broxbourne, also began to make architectural works, and Mr. Blanchard, at Lambeth, who made specimens for the Exhibition of 1851, as did Messrs. Doulton, of Lambeth, and several other persons. The Earl of Leicester also made about this time some moulded bricks, chimney shafts and other architectural pieces from drawings by Mr. Bodger, formerly in Mr. Pennethorne's office.

Blanchard has executed nearly the whole of the architectural terra cotta work for the new buildings at the South Kensington Museum, and numerous other large works.

Blashfield began to make terra cotta at Mill Wall in 1848, and at Stamford in 1858. Previous to 1848, he made terra cottas occasionally by way of experiment, as in 1839 when he employed Bubb, but did not enter fully into the merits of the subject until about twenty years since.

When the Governors of Dulwich College entrusted the works of their new College to me, without interference as to style or material, (but only that inevitable trammel as to cost to which we architects must perforce submit) I felt that my old dream of long ago might be realized, and I have endeavoured to produce a building almost wholly in terra cotta of varied colours, and striven to embody therein something of the stateliness, and at the same time the elegance and fancy in details of these old specimens. As a maiden essay, of course it is full of defects and shortcomings, to which no one is more alive than myself, but if it should help to lead others of my professional brethren with larger opportunities and richer exchequer to draw upon, to carry on the employment of terra cotta in England, it will have served as useful a purpose as I could have hoped.

Leaving now the *history* of what has been done, which might be extended to very great length without losing its interest, I proceed now to the more *practical* part of my subject, and propose to deal with it under the following heads :—

(1) The materials used, and the mode of manufacture.
(2) The advantages attendant on its use in lieu of stone.
(3) The difficulties which attend its use in an ordinary architectural work.
(4) Its cost, compared with stones in ordinary use.
(5) Its resistance to tranverse and crushing strains.
(6) Its durability and miscellaneous special qualities.

(1.) MATERIALS AND MODE OF MANUFACTURE.

The materials used are the clays of Cornwall, Dorset, and Northamptonshire—Lynn sand —ground glass—China-stone—felspar and flint—also broken terra cotta or burnt ware, pulverised. For very light porous articles fossil bone is used with terra cotta. The variation of colour in white, buff, and red terra cottas is due to the clays; other colours, such as black, grey, green, blue, &c., are obtained by the admixture of mineral colours with clays and other substances forming the body of the ware.

The whole of the clay and other materials are reduced by grinding them to powder of necessary fineness to suit the size and description of ware intended to be made. For fine ware, it is necessary to, what is termed, slip or wash these bodies together and evaporate a part of the water by means of a slip kiln. For large coarse ware, it is sufficient to mix the proper quantity of each substance together in powder, and after adding a given quantity of water, to knead or pug it in a mill; and, to insure thoroughly of delicately varied harmonious tints. Those most easily available for building purposes are buff, of various shades, from gold colour to nearly brown; a light neutral tint, or grey; and any tint of red, from the palest to the deepest. To these may be added many other colours produced by chemical materials mixed with the clay, but of course somewhat increasing its cost. Add to the above the facility for enamelling or glazing the surface, thus heightening the colour of any particular parts, and it will be seen that a chance is given to the architect who desires and will take the trouble *to design in colour*, which is not possible with other materials, unless at a fabulous cost, and even then, as when marbles are used, retaining their effect for only a few years if used externally.

Next, there is its indestructibility and freedom from decay by the action of weather, whereas in England, and especially in the metropolis or other large towns, the effect of the weather and the acid gases the atmosphere contains, soon disintegrates any soft stones, and a little later has a like effect even on hard ones, or marble, producing laminated surface, mouldering edges, and discoloration. With terra cotta the reverse is the case. The acid gases in the air have no effect; the deposited dirt or soot washes off with the first heavy shower, and the work comes out again as pure and distinct as at the first. If it be said that this is perhaps not always desirable, and that a certain amount of decay adds to the picturesque effect of a building, I think it may fairly be replied that, if so, it is rather an evidence of the carelessness or defects of the design, if it be improved by such adventitious aids, the greater or less extent of the effect of which must be quite uncertain, dependent on local circumstances, and no creation at any rate of the architect's mind, whereas his knowledge that as in form so in colour, any creation of his fancy will be handed down unchanged for centuries as it comes from him, will tend more than any stimulus to that tender carefulness of design, which all architects ought to possess and foster, and which will give them credit, and delight the taste of those who come after them.

Next, there is the practical question of weight, and consequently of cost of transport. In the case of stone brought in masses to the building and then worked up, the necessary quantity of waste makes up an alarming amount of useless weight, which has to be transported in order to produce a given result. With terra cotta, on the contrary, where the work is necessarily modelled in the workshops and studio of the manufacturer, and moreover is (for thoroughness in burning) made of moderate thickness and hollow, the weight to be conveyed is reduced to a minimum, and when at the building, the economy in moving about masses of only moderate weight on the ground and on the scaffold will be at once apparent. It will here not be out of place to mention that the weight of terra cotta as compared with some building stones is as follows:

	Per foot cube.
Portland stone	158 lbs.
Hopton Wood ditto	158 ,,
Ancaster stone	140 ,,
Ketton	128 ,,
Terra cotta, if solid	122 ,,
Ditto, if used as usual, of a thickness of about 2 in. and hollow inside, averages only	68 ,,

Lastly, I will name an advantage which is certainly not less than the above, viz. that as in terra cotta mouldings, cornices, panels, sculpture work, and the like, have all to be run or made at a manufactory, the tendency, and indeed inevitable effect, must be to make the terra cotta manufacturer an artist too, if he be not so already; and if he is not, he has very little chance of successful employment by architects, who on his premises spend their time, work out their own thoughts, and will be quick to perceive and foster the man who enters *con amore* into their thoughts and feelings, and to a great extent sinks the mere tradesman in the artist workman.

(3). DIFFICULTY IN USE OF TERRA COTTA.

It is, however, fair and right to look at the other side of the case, and point out some of the disadvantages in the use of this material that do certainly exist, and cause much vexation at times to the architect.

Of these, perhaps, the most embarrassing is the arrangement necessary to have the terra cotta blocks made and ready on the ground almost before the rest of the work is begun, in order to work in when wanted as the bricklayers progress. At times this is found impossible, and annoying delays in the general work take place, for which clients will be apt to blame their architect. The lesson of course to be learnt from this, is to carefully mature the design at the outset, instead of our contenting ourselves, as we now too often do, with a mere sketch of what is intended, with the hope and intention of working in parts as time goes on and the work proceeds. I am not sure that architects ought to object to this, since it must produce decision of thought and precision of detail, which may be an advantage in an educational point of view, and is a serious corrective to indolence of thought in design.

There is some considerable extra labour in the office put on the architect by the use of terra cotta, arising from the necessity of making all full-size detail drawings full $\frac{1}{12}$th larger than the work is to finish, in order to allow for its contraction, which I have already said is in that proportion. I have found it necessary, therefore, to make two drawings for all such parts: *one* made with the usual 12 in. scale, for the use of the general contractor, the calculation of bonding courses—of the breaks, and the like; *the other* made with a special scale, 13 in. in length, but divided into twelve parts, representing inches; and with this scale making all drawings (full size) which were to be supplied to Mr. Blashfield.

Another disadvantage is, of course, the risk in making and burning, which has been adverted to, the annoying result being sometimes that all the pieces of a large window or door are perfect except a few, but these few being equally essential with the rest, the work must stop till new blocks in lieu of the defective ones are made,—a matter generally of several weeks, or a temporary block must be put in and replaced with the proper one when ready.

Next, there is the difficulty (which is, indeed, wholly a maker's difficulty) of burning blocks which are to constitute jambs, strings, and continuous features, so as to be perfectly true and correct in the mouldings. That this is only a maker's difficulty and will be got rid of, if the use of terra cotta in England receives the encouragement that it seems to me to deserve, I cannot doubt; the marked improvement that has taken place in this respect in the work sent up now to Dulwich, compared with that at first sent, is a complete proof of this. At the same time let it be remembered that the joints and surface of adjacent blocks can be brought into truth after being set, by rubbing down with sharp sand and water; nor if the ware is properly made, homogeneous throughout its mass and well burnt, is there any risk from rubbing down of getting a less lasting weather surface. I found this process of rubbing down much needed with the first work sent to Dulwich, but as I had contracted with Mr. Blashfield to fix his work himself, true and correct, the expense thus caused to him, without repayment, produced such increased care in the making, drying, and burning, that little or no such rubbing down is now needed. The same remark may be made as to the lines and arrises of mouldings made in lengths; there is no eason for their having a round or concave edge; but to prevent it, certain precautions must be taken efore the work is burnt, and it is only necessary for architects who use terra cotta to let the makers know that they will not pass work defective in this and some other respects, to ensure that perfection in line, surface, mitres, and the like, which is necessary to good effect. Here, however, I would say that, of course these risks are much reduced if the size of the blocks is not great, and all idea of imitating the large blocks which are to be had in stone is given up. There is no difficulty in this, and indeed it is questionable taste to attempt it, even if it were easily practicable, inasmuch as a peculiar distinctive effect arising from the size of its pieces may, and should, perhaps, be preserved, and make at once evident to a spectator that he is looking at a terra cotta building, no less than is now the case with a stone or a brick one.

(4). Cost of Terra Cotta Work.

I will now touch on that question of so much interest and importance to architects, viz., that of *cost*, and in doing so, I think it right to say that although I shall mention some actual facts by way of examples which, as far as they go, are highly satisfactory; yet, in my opinion, the cost of terra cotta would be largely reduced, if it became, as I hope it may become, a material far more largely employed in this country than it has been—the items which make up the cost of terra cotta are of course, in the first place, the clay or clays used, and their necessary weathering, mixing, and duly amalgamating; and in this part of the process greater experience will lead to greater certainty, as to the best mixtures with reference to colour, homogeniety, equality of contraction, power to resist weather, and mechanical strain, and hence some of the economy to which I have alluded may arise with greater demand for the work. Next there is the manual labour of working the clay into forms required, which I am sure, from my own observation, may be much reduced and superseded by mechanical appliances, if the cost of machinery can be incurred. Next there is the air drying, the time this process takes, and the shed space required for extensive works. Next the masons' work, while the material is hard and dry but not burnt, to make the blocks or mouldings true and square in their arrises, &c. Next the cost of kilns and their wear and tear, and the cost of fuel. In each or all of these items in the manufacture, we cannot doubt that more economical arrangements might be made than those now found in terra cotta manufactories, but as all such appliances and machinery are in the first instance costly, it becomes essential that the manufacturer should clearly see such a probable demand by architects and the public for his work as may justify him in the outlay necessary. At the same time, with all these drawbacks, the economy of terra cotta, as compared with stone is great. Speaking in general terms, I think I may say that taking cube for cube as fixed in a building, terra cotta costs a little less than the soft stones, as Bath, Caen, &c., while as regards Portland, the average difference would be about 35 to 40 per cent. The greatest economy is to be found when there is much work either in under-cutting of mouldings (which cost nothing extra in terra cotta over ordinary mouldings) and in artistic modelled work; when, as I have already said, under-cutting and almost full relief of features is as cheaply produced as low relief. In these cases the economy is often several hundred per cent. over hard stone. Plain strings, friezes, and plinths, cost comparatively more in terra cotta than other and more enriched works in the material.

To give the members of the Institute some useful facts, I will mention that the ground-floor windows at Dulwich, shewn in the drawing exhibited, have been made and fixed complete for £19. each, their cost in Bath stone would have been £20., and in Portland £28.

The principal floor windows, which are of rather elaborate design, have been fixed complete for £41. each. They would cost in Bath stone £57., and in Portland £86. This cost includes the modelling the busts in high relief, which are all different, and represent from carefully sought out authorities where they can be found, men of literature, science, art, philosophers and sages of antiquity. There are also the Muses, and a few fanciful and original female heads taken from the most familiar characters of Shakespeare. These windows do not come with all their work to more than 5s. 6d. a foot cube. The second floor windows have been fixed complete for £10. each; they would have cost in Bath stone £19., and in Portland £28. 10s.

The cornice will be seen to be richly treated, the whole is terra cotta, save only the corona, which is formed of a slab of Portland stone, bonding right through the wall. When this was designed I did not know so much of the qualities of terra cotta as I now do, or of its transverse strength; but in a future case I should not hesitate to make these slabs in terra cotta. The cost per foot run of this cornice, which is 15 in. projection and 4 ft. high (exclusive of the stone corona) fixed complete is 33s. a foot run. In Bath stone it could not be done for less than 80s., and in Portland 120s. per foot run.

A double-sided moulded coping, suitable for balustrades, walls, &c., 14 in. wide and 9 in. high, costs in terra cotta about 2s. a foot. It would cost in Portland 3s. 9d. to 4s. The cost of terra cotta for garden balustrades, vases, terminals and the like may be stated to be between that of cement and stone; for instance, a bust, heroic size, can be modelled as an original work in terra cotta, and completed for £10. or £12. A statue life-size for £25. Balustrades of ornamental character, with base and capping complete for 12s. to 15s. per foot run. The cost of the open parapet to the railway viaduct of the Brighton Railway Company in Dulwich was, exclusive of base and coping, only 5s. a foot run of a thickness of six inches.

I have referred to solid terra cotta blocks, and those made hollow with an average thickness of two inches of material. The specimens in the room will explain what I mean. There is no physical difficulty in producing solid terra cotta, and using it as cube stone; the only difficulty being the long time such blocks, if of large size, take to dry thoroughly and equally throughout their mass, and to be thoroughly burnt in the kiln. Considerations of strength do not render this use of solid blocks necessary, as the strength of hollow filled blocks is very great, and quite sufficient in nearly all cases. I shall advert to this part of my subject again, but meanwhile, as we are upon cost, I will say that *solid* terra cotta blocks can be made in ordinary colours at about 3s. 6d. a cube foot. If the blocks are made hollow and filled in with broken terra cotta or brick in Roman cement, the cost may be stated at 3s. 1d. a cube foot; these pieces include all ordinary face work in mouldings, panels, &c. The relative cost taken in the same way would be about 5s. 6d. for Bath stone, and 9s. for Portland stone.

In this place I may properly say a word as to the filling in referred to. This, it is found, should always be done with good Roman cement, and not Portland, Lias or other cements, which all contain more or less lime in a free state. Particles of lime may be found in a latent state in nearly all the ordinary Portland cements; these particles do not slack or expand for a long time after the cement has apparently set, and when they do in a confined space, such as a hollow terra cotta block, they do so with expansive force enough to crack a block several inches thick. Roman cement does not seem liable to this, and may, I think, be safely used; also pozzuolana, thoroughly slacked lime and clean sand. It requires about one peck of sand and one peck of cement to make solid a cube foot of terra cotta with a thickness of two inches of that material. These hollow blocks so filled in may be very thoroughly and economically bonded together in the most solid way by pieces of galvanized hoop iron being turned into the hollows of adjoining blocks before the cement filling is run in.

In the work at Dulwich College it will be seen, on reference to the section on the wall, that I have used these filled-in blocks bonded into the walls just as stone would be used, and I think this is the only legitimate way in which to employ the material, and give it its true value as a building material. Mr. Scott, in one of his works, calls terra cotta "The highest development of brick," as such it should, I think, be used, bonding into the work as brick does, but in proportion to the size of *brick* or *block* employed. In some works recently executed this has not always been done, and terra cotta has been put on as face slabs, or filled in to brick openings, like a wood sash or door frame would be, and not bonded at all. I have endeavoured to obtain information from actual sectional measurement of how the terra cotta was treated in this respect by the old Italian architects, but without any definite success. All the published works shew external profiles and views, but never, as far as I can find, *the section*. I believe myself that the old architects, like ourselves, sometimes bonded in and sometimes did not, and that the instances of the first method remain to us for our instruction, while the others have become more or less ruinous.

(5.) STRENGTH OF TERRA COTTA AS A BUILDING MATERIAL.

The next part of my subject will be the strength of good terra cotta, as compared with that of stones in ordinary use. At my request, Mr. Blashfield has had a series of interesting experiments made by Mr. Kirkaldy, of the Grove, Southwark, whose special attention for some years has been given (as many in this room are aware) to testing the strength of materials of all kinds with a degree of precision and philosophical nicety that render his results most useful and perfectly reliable. The following table will shew the results, and will, I am sure, convince architects that we have here a very trustworthy material.*

A 12 in. cube of Portland stone stood a crushing strain of .	283	tons.
Ditto of Bath ditto ditto .	88	,,
Ditto of Terra cotta block of similar size .	442	,,
A good hard stock brick has also been tested (Exp. No. 710) of the usual size, about 9 in. by 4½ in. by 3 in. and stood	17	,,
A terra cotta block (Exp. No. 671), nearly the same size, or 12 in. by 4 in. by 3 in. stood a strain of . .	125	,,

It will be seen from the Table of Experiments that forty-six experiments have been made with different shaped pieces of terra cotta, some of them solid, some hollow but left empty, and some with the hollow blocks filled in, as I have used them at Dulwich, with brick and Roman cement. The result of experiments Nos. 651, 652, shew that the filling in doubles the strength of the hollow blocks, as the one shewed signs of cracking with a strain of forty-two tons to the square foot, and the other required eighty-six tons to produce the effect. In these two experiments, I should mention that the ware was 1½ in. thick only, while the thickness of that used at Dulwich is always 2 inches.

The first experiment in the table, No. 638, is an interesting one; it shews that a solid 12 in. cube of terra cotta will not shew a crack until a crushing strain is applied of 442 tons to the square foot, and to crush a hexagon stable floor brick 4 in. diameter and 2½ in. thick (Experiment, No. 669) required no less than 855 tons. No. 644 is a specimen of the terra cotta I have used for the shafts to jambs and mullions of principal floor windows, which are proved capable of bearing a pressure of 246 tons on the square foot. Thinking the whole table an interesting one, I have appended it complete at the end of the paper. I also took the opportunity, as seen above, of trying like experiments on pieces of Portland (Experiment, No. 706), and Bath stone (Experiment, No. 708) of similar shape and sizes, but I think enough is here shewn to shew that terra cotta may very safely be used for any purpose in building to which stone can be applied. Mr. Blashfield informs me that the terra cotta of the specimens here experimented upon is a composition of clays from Cornwall, Devon, Poole and Northampton, blended together and mixed with ground glass, felspar, Lynn sand and pulverized terra cotta fragments. Before leaving the experiments, it may be remarked that the clays which are technically termed "fire clays," and resist the largest amount of heat are the weakest against a crushing or transverse strain, and those which flux or run at a less heat are the strongest. The pieces experimented on, which were hollow, were filled with Roman cement twenty-seven days before the trial. With a longer time, the cement would have been more completely hardened, and a greater pressure would have been resisted, but this was done to represent roughly what would actually be the case in the progress of a building.

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* The table which contains the results of forty-six experiments will be printed with this paper, but I have selected some of the most useful experiments for the diagram on the wall.

(6.) GENERAL REMARKS ON OTHER QUALITIES OF TERRA COTTA.

The relative absorption of terra cotta and stone, such as Bath stone, as a measure of possible decay, is also interesting. It has been found to be very considerably less, but I have not had the time (as I had intended) to test the proportions accurately, as compared with Bath, and with Portland and other stones.

When it was subject of debate with Mr. Page, whether stone paving or terra cotta tiles should be used for the footways of Westminster Bridge, he was anxious to test its wearing capabilities for foot traffic, and had an experiment tried by grinding together with sharp sand and water a terra cotta tile 12 in. square and a similar piece of York stone. The friction was continued for five hours, at the end of which it was found that the terra cotta tile had lost 1-16 in. of thickness, while the York stone had lost ¼ in. The cost of such tiles as those of which this pavement is composed can now be stated at 7½d. a square foot, exclusive of cost of laying. The tiles for Westminster Bridge were made and pressed by hand; they have stood the wear of six or seven years in as busy a thoroughfare as any in London, with no very serious wear. If made now, they would, however, be pressed by machinery, and be much harder and more durable.

It is necessary here to caution my hearers that all that has been said is of course only applicable to terra cotta in the proper sense of the word, that is a "body" composed of such materials as have been above enumerated, very carefully mixed and blended, and very carefully burnt, with a proper regard for the greater or less amount of firing which experience teaches is required for different "bodies." Some materials, I am informed, are offered as "terra cotta" in the market, which are nothing but clay and common sand. Such compositions will not bear, without great distortion, the necessary firing heat, and are consequently soft on surface, with little transverse strength, and not durable. This ware of course has the specious advantage of being much cheaper, and therefore architects should be very careful to test the terra cotta of any particular maker before deciding to use it, if they do not wish the surface of their work in a few years' time flake off like bad brick.

There has, however, recently been discovered at Watcombe, in Devonshire, some very excellent terra cotta clay nearly pure from all foreign matter. The ware made from this, without any mixture of other substances, is said more nearly to resemble the best Italian terra cotta than any other. It belongs to Mr. Allen of Watcombe, a gentleman of scientific knowledge, who has spent some time and made many experiments upon it, and it has been analysed by Dr. Percy, at the Laboratory attached to the Museum in Jermyn Street, whose report I have appended to this paper.*

It has not yet been largely introduced into the market, but as it is found in an enormous mass not far from the surface, and as it is considered that it can be put on board ship at Watcombe for about 3s. a ton, no doubt it will receive the attention its merits may deserve. Some specimens of articles made from it are on the table.

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* Two of these articles were made at Bovey Tracy Pottery in Devonshire. The other five specimens were made by the Messrs. Davenport and Banks, of Etruria.

There is, no doubt, much more interest taken in this material quite recently than for a long time previously. Among former instances of its use I may advert to the statues, panels, relievi, capitals, friezes at Buckingham Palace, which were executed by Croggon. *Rossi* executed the statues, antifixæ, pateræ, &c. at St. Pancras Church, at a cost, by the way, of £12,000. *Bubb* made the bassi relievi in the façade of the Opera House in the Haymarket; *Messrs. Cubitt* a great deal of ornamental terra cotta work to the London and North-Western Railway Station at Broad Street, City. They have also done work in cornices and strings at Darleston Hall; and some terra cotta work at Columbia Market, lately erected for Miss Burdett Coutts by Mr. Darbyshire. *Mr. Blanchard* has done several large works recently, among them the Charing Cross and City Terminus Hotels, the Star and Garter Hotel, and nearly all the terra cotta work at South Kensington; he also executed a large number of garden works for my late father, as well as the capitals to the Corinthian columns of the façade at Cliefden House, near Maidenhead. *Mr. Blashfield* has executed considerable works for India in public and private buildings at Bombay and Moorshedabad, also for buildings in New Zealand; while at home, he has done the work at the Duke of Cornwall Hotel, Plymouth, for Mr. Hayward, architect; the Sun Fire Office, Charing Cross, for Mr. C. Freeman, architect; Hall and Allen's new warehouse, St. Paul's Churchyard, for Mr. R. Tress, architect; the Town Hall, Farnham; some work at Castle Ashby and the New India Office, for Mr. Digby Wyatt; and under my own direction has executed the works at Holy Trinity Church, Barking; the parapets, panels, &c. for the viaduct in Dulwich of London, Brighton and South Coast Railway; and the works at New Dulwich College.

For grave stones and sepulchral monuments in the open air terra cotta seems peculiarly suitable, as it is fondly hoped by relatives that these memorials from the living of the dead shall remain unchanged for ever. In terra cotta there would be no falling off of decorations, no obliteration of inscriptions as we now see is the case with the stone monuments in our churchyards and cemeteries.

The following rough and no doubt very imperfect list of some of the best moulded brick remains in England will have some interest, and can no doubt be largely added to. It shows that a considerable development of the use of this material took place in the Eastern counties, possibly from the abundance of clay and comparative scarcity of building stone in those counties. I have endeavoured to fix the dates to these works as well as I could.

	DATE.
Little Wenham Hall, Suffolk	*about* 1260
Oxburgh Hall, Norfolk	Reign of Edward IV.
Eton College	,, Henry VI.
West Stowe Hall, Blackburn, Suffolk	,, Henry VII.
Nether Hall, Essex	,, do.
Tattershall Castle	*about* 1455
Blickling Hall, South Erpingham, Norfolk	Reign of Henry VIII.
Giffard's Hall, near Bibury, Suffolk	,, do.
East Basham Hall, Suffolk	,, do.
Wolterton Hall, near East Basham	,, do.
Hampton Court Palace	,, do.
Oxhead Hall, South Erpingham, Norfolk	,, Elizabeth.
Holland House	*about* 1607

The growth of interest in making terra cotta is perhaps represented in an encouraging way, when I name that in the International Exhibition of 1851, only 18 Exhibitors were represented, while that number was more than doubled in 1862, and I believe a still larger number presented themselves at the Paris Exhibition of last year.

There need be no jealousy or fear on the part of masons, that if terra cotta be largely substituted for stone, their trade will be injured. It is but a new material *for them* with only this peculiarity, that their work with it lies in the manufactory when the clay is in a rather hard dry state. Then they can work mouldings, mitres, &c., in it with ease and perfect truth—then stone carvers may add their work of taste and fancy in a material soft and plastic enough to give them free scope, but to become as their hands leave it, by being then burnt, an imperishable work. In the building, also, terra cotta should always be fixed by a mason, and not an ordinary bricklayer.

I have now touched, I believe, on all the more important points connected with the subject I had in view, viz.: the greater introduction of terra cotta for architectural works than for many years past has been the case, and I can only hope the patience of my audience has not been quite exhausted. Much might of course be said of the application of such a material for decorative purposes, such as diaper wall enrichments, balustrades, terminals, bases, statues, fountains, garden edgings, and other matters connected with garden architecture, where no great qualities of strength or wear are necessary, though the resistance of terra cotta to the action of weather, and especially frost, makes it particularly valuable for these purposes, and far superior to any stone, while its cheapness is a further recommendation. For internal decoration its capabilities of being made in a great variety of colours, any of which can be enamelled and blended with portions gilt, silvered, or bronzed, make it peculiarly suitable; in short I may repeat the remark made at the commencement of this paper, and say we have here a material which, for structural, decorative, and many useful purposes, has not received from us the study and attention it deserves, nor so much as it has received in past ages of the world. If architects could be now led to give this study, and try to introduce terra cotta generally into their works, the manufacturers would be encouraged to spend money in producing a material which would be unequalled. Such encouragement was given 30 or 40 years to the different kinds of stucco and cement, and with important results in this respect, but after all that has been done and discovered, that material is but a perishable one after all, needing constant painting to preserve it, and subject to many other inconveniences. Terra cotta, on the other hand, when once well manufactured and burnt, is practically everlasting and unchanging in its artistic effect, and it may be in some ages to come, when our stone and stucco buildings may have become ruinous, or altogether disappeared, that as in Egypt, as in India, as in America, so the terra cotta works of England may remain as one of those "landmarks of the civilization of mankind" in England, to which Sir Charles Lyell alludes.

Before concluding this paper, I feel it only an act of justice to express my obligations to Mr. Blashfield for much valuable information, which has been incorporated with this Paper. His skill and perseverance in manufacture is extraordinary, he is daunted by no failures, but views them only as reasons for renewed efforts, and of course in the majority of cases, such pertinacity receives its deserved reward in success, though frequently, I fear, at considerable pecuniary sacrifice of profits. His intimate acquaintance, too, with all works written on this "Art manufacture," for such it is in every appropriate sense of that word, both antient and modern works, is very great, and his artistic taste is well known to many of my hearers. If only all those who devote themselves to the manufacture of terra cotta for architectural purposes, have or acquire the like qualities, I hope I foresee a future for this branch of art-work in England, which shall compare without fear with the best of similar works to be found in any country.

My Paper has been a much longer one than I anticipated, but as I have proceeded with the writing it, information has presented itself, which I felt I ought to give the Institute as well and completely as I could, and I can only now thank my audience for the patience which, I fear, I have almost too far presumed upon.

The best thanks of the meeting were then passed to Mr. C. Barry for his interesting paper, the discussion on which was reserved for an early meeting next Session.

DR. PERCY'S REPORT AND ANALYSIS OF THE WATCOMBE TERRA COTTA CLAY.

Metallurgical Laboratory,
28, Jermyn Street,
4th July, 1865.

Sir,

I have pleasure in forwarding the results of the examination of the Red Clay sent by Mr. Allen.

The sample of Clay in its moist state as received here contained 21·42 per cent. of hygroscopic water. The analysis of the Air-dried Clay gave as follows:

Composition per Cent.

Silica	57·83
Alumina	20·55
Peroxide of iron	7·75
Oxide of manganese	traces.
Lime	1·68
Magnesia	0·97
Potash	3·87
Soda	0·56
Carbonic acid	0·90
Phosphoric acid	traces.
Organic matter (small quantity) Combined water	4·39
Hygroscopic water	2·13
	100·63

It was also examined for sulphur and chlorine, but none was found.

The silica (about 21·21 per cent.), as is usual in clays, is partly in combination with the alumina, the remainder being present as fine sand. The hygroscopic water would be expelled at about 212° F. The plastic nature of the clay depends upon the combined water (*i. e.*, water in chemical combination with the ingredients of the clay); this is expelled on firing. As the clay is readily fusible into a black glass at a high temperature from the presence of peroxide of iron, lime, &c., it renders it unfit for purposes for which fire-clays are applicable. The clay appears to work up well, and when fired at a lower temperature has a red colour, and might be used for making terra cotta and certain varieties of pottery. Specimens of the fired clay have been forwarded. As the amount of alkalies (potash and soda) appears to be somewhat large, three separate estimations were made, which closely agree.

I am, Sir,
for Dr. Percy,
Yours obediently,
RICHARD SMITH.

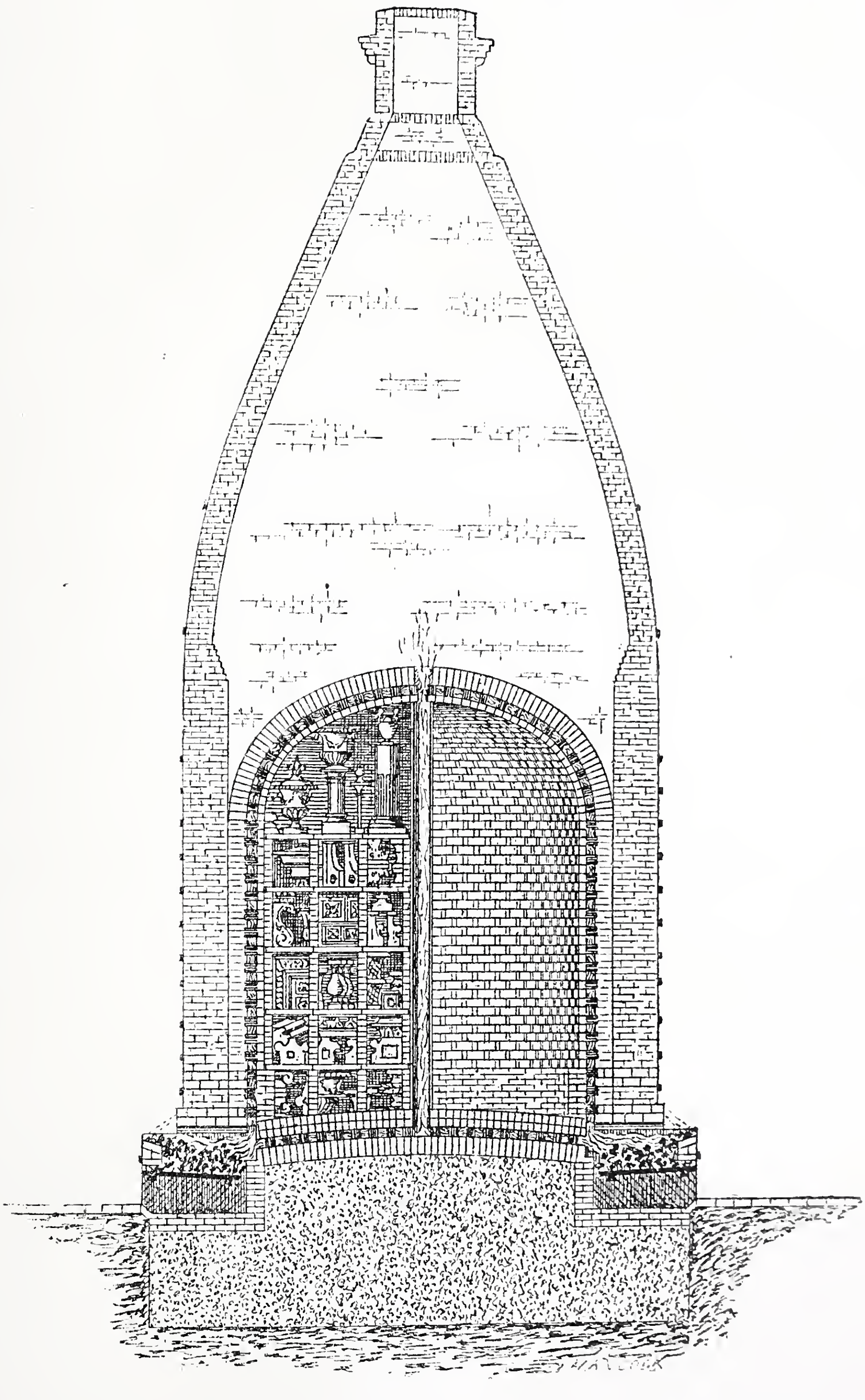
S. Dunning, Esq.,
27, Parliament Street.

LIST OF BOOKS AND WRITINGS RELATING TO BRICKS, TERRA COTTA, AND OTHER ANCIENT POTTERY.

Chapter XI. verse 3		Genesis.
" Come let us make brick and burn them thoroughly, and they had brick for stone."		
Chapter I. verse 14		Exodus.
" And they made their lives bitter with hard bondage in mortar and brick."		
Chapter V. verse 7.		Exodus.
" And you shall no more give the people straw to make brick."		
Chapter III. Especial reference to the antiquity of burnt brick and other works in clay, pp. 35, 36, 37 and 40.	Lyell	Antiquity of Man. 1863.
Chapter II. section 3, pp. 15, 16, 17, 18, 19, 23, 32, 44, 48, 49, 51, 55, 58.	Gwilt	Encyclopædia of Architecture. 1842.
Burnt bricks	Layard	Excavations at Thebes.
Statuettes and other pottery in the ruins of Thebes.	A. Marriette	Excavations at Thebes.
Book XXXV. Chaps. XII, XIII, IV.	Pliny	History of the World. Translated by Holland. London, 1635.
Vol. I. pp. 38, 43, 94, 110, 114, 117	Gell	Pompeian.
Tome III. première partie, livre 4. ... Greek and Etruscan pottery.	Montfaucon	L'Antiquité Expliquée, &c. Paris, 1719.
Greek and Etruscan pottery	Passerio	Picturæ Etruscorum. Rome, 1767.
Greek pottery	Dubois Maisonneuve...	Peinture des Vases Antiques. Paris, 1808.
Greek pottery	Sir Henry Englefield..	Vases, &c. London, 1819.
History and description of ancient terra cottas, especially those found in Magna Græcia.	Sir William Hamilton	On Terra Cotta, Nola, and Vulci.
Ancient terra cotta works	H. Moses	Collection of Vases, Altars, &c. London, 1814.
Decorations on ancient Greek pottery.	Hope	Costumes of the Ancients. London, 1812.
Full description of sizes of cornices, friezes and other works.	G. & W. Nicol	Description of Ancient Terra Cottas in the British Museum, with Engravings of Friezes, &c. London, 1810.
Description of more than 1200 specimens.		Catalogue of Greek Etruscan Vases in the British Museum London, 1851.
Etchings of ancient brick and marble buildings.	Piranesi	Rome, 1752.
Vases, lamps, &c., in terra cotta	Piranesi	Rome, 1782.
Illustrations and descriptions of ancient brick and stone buildings in Southern Italy, &c.	Luigi Rossini	Le Antichita dei Cortorna di Roma. Rome, 1826.

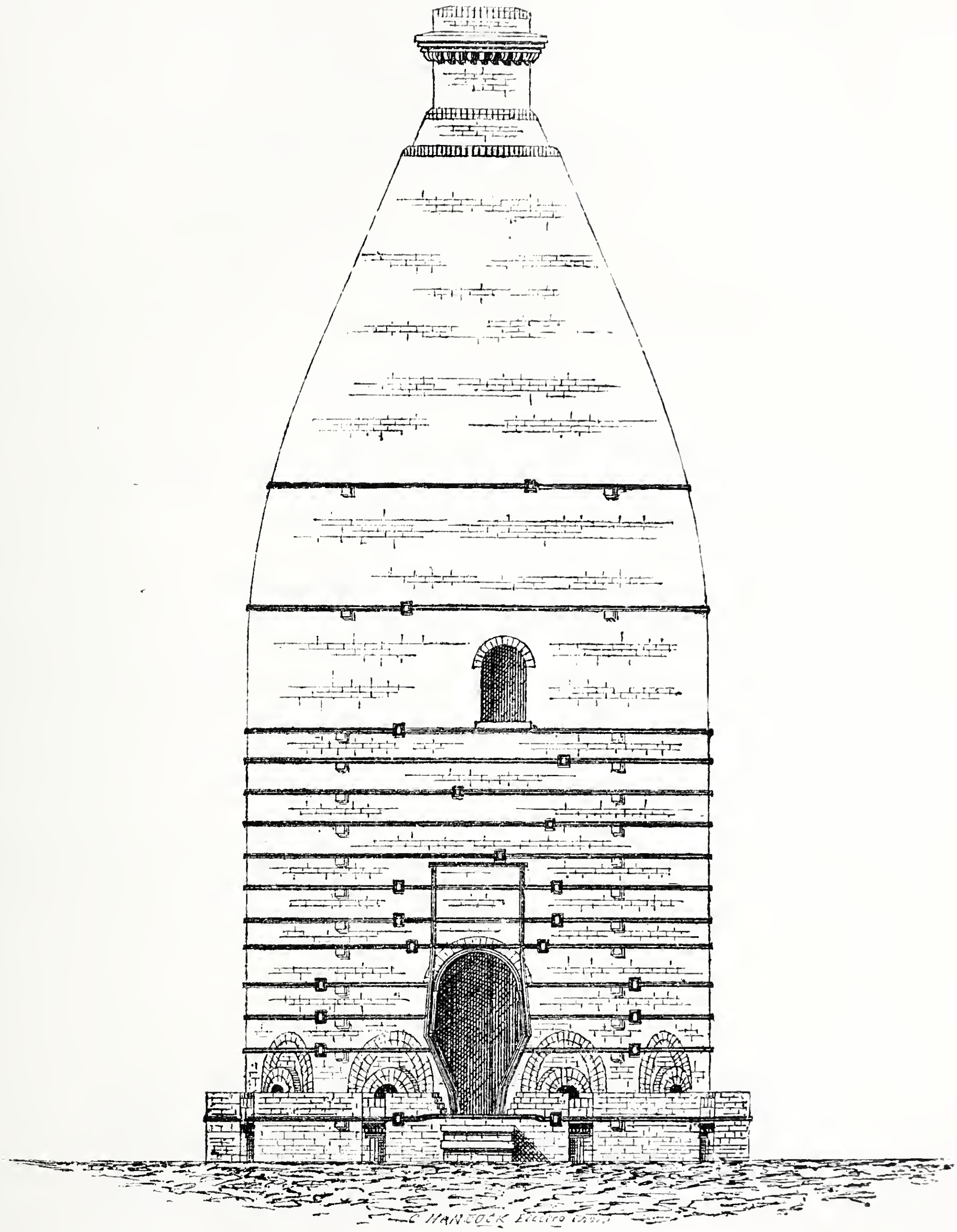
Ancient bricks, tile and earthen Mosaic work.		Gli ornati delle pareti ed i pavimento delle stanze dell' antica Pompeii Napoli della Stamperia Regale. 1796.
Mosaics and tiles in earthenware		Discurso sotre el origen y principio de los Mosaycos y suo Varias Materias, &c. Madrid, 1788.
Roman brickwork and pottery	Knight & Co.	Old England, Knight & Co. London, 1845.
Antique brickwork, clay coffins and Roman brick remains in England, and Roman domestic pottery.	Charles Roach Smith..	Illustrations of Roman London. 1859.
Roman brickwork and pottery	Timbs	Curiosities of London. 1868.
Roman pottery and Roman kilns, ancient potters' tools, &c.	E. T. Artis	Durobrivæ of Antoninus. London, 1828.
Vide article "Brick and Terra Cotta."	Robert Stuart	Dictionary of Architecture. London.
Vide article "Brickmaking"	James Elmer	Dictionary of Fine Arts. London, 1826.
Italian and French pottery	Marryat	Pottery and Porcelain. London, 1850.
Majolica ware, &c.		
Italian pottery, &c.		Life of Bernard Palissy. London, 1852.
Composition of pottery		Treatise on Porcelain, Glass, &c. Longmans, 1852.
Illustrations and description of Manufacture of bricks, tiles, and other pottery.	Knapp	Chemistry applied to the Arts and Manufactures. Vol. II.
Description of old English moulded brickwork.		Vetusta Monumenta. Vol. IV. 1815.
Illustrations and description	John Britton	Architectural Antiquities of Great Britain. London, 1814.
Terra cotta and moulded brick building in Italy.	Waring & Macquoid .	Examples of Architectural Art in Italy and Spain. London, 1850.
Moulded brick and stone buildings ...	Richardson	Old English Mansions. London, 1848.
Minutes of evidence, p. 43, on antique terra cotta and British pottery.		Parliamentary Report on the Arts and Manufactures of Great Britain. 1836.
Remarks on brick buildings, terra cotta, &c.	Scott	Architecture, Secular and Domestic. London, 1857.
Moulded brick and terra cotta buildings in North Italy.	Gruner	Terra cotta of North Italy. London, 1867.
Size of Roman bricks, moulded bricks at Waltham Abbey, Sutton Park, &c.	Parker	Glossary. Oxford, 1845.

Among other authors on ancient terra cotta, may be mentioned—Winckelman, Leinengen, Raoul Rochette and D'Hancarville.



SECTION OF J. M. BLASHFIELD'S
PATENT POTTERY KILN

⅛" SCALE



ELEVATION OF J. M. BLASHFIELD'S

PATENT POTTERY KILN

1/8" SCALE

APPENDIX TO MR. BARRY'S PAPER ON TERRA-COTTA.

RESULTS OF EXPERIMENTS

TO ASCERTAIN

THE RESISTANCE TO A TRANSVERSE OR BENDING STRESS

OF

A SPECIMEN OF TERRA-COTTA,

MANUFACTURED BY AND RECEIVED FROM

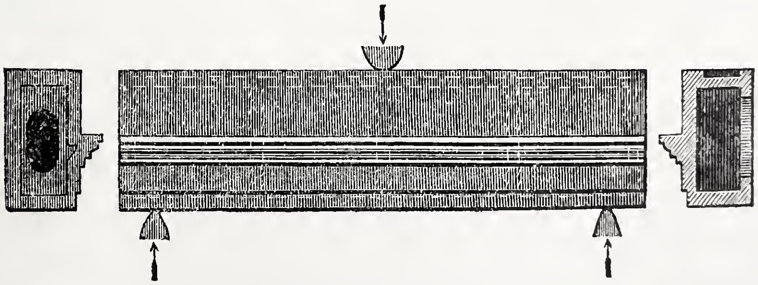
J. M. BLASHFIELD, STAMFORD.

TEST NUMBER, C 678,

BROKE WITH 7,718 lbs., OR 3·45 Tons APPLIED IN THE CENTRE.

DISTANCE BETWEEN SUPPORTS, 36 INCHES.

A PIECE OF WINDOW ARCHITRAVE.



Testing and Experimenting Works,
The Grove, Southwark Street, 17th June, 1868.
DAVID KIRKALDY.

RESULTS

TO ASCERTAIN THE RESISTANCE TO A THRUSTING STRESS OF VARIOUS SPECI NS
ALSO SPECIMENS OF PORTLAND AN BA

BEDDED BETWEEN ECES

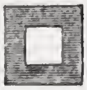
Test No.	Marked.	Description.	Woodcut.	Dimensions.	Base Area.	Cracked Slightly. Total.	Cracked Slightly. Per square inch.	Cracked Slightly. Per square foot.	Cracked Generally. Total.	Cracked Generally. Per square inch.	Cracked Generally. Per square foot.	Crush. Total.	Crush. Pe squa incl
C.				H. L. B.	Sq.inch.	lbs.	lbs.	Tons.	lbs.	lbs.	Tons.	lbs.	lbs
638	No. 2. 15	Cube, solid	A	5·90. 5·88 × 5·90	34·69	238,960	6,888	442	255,350	7,361	473	282,520	8,14
639	,,	,, ,,	,,	5·92. 5·90 × 5·86	34·57	202,730	5,864	377	212,550	6,149	395	224,920	6,50
632	MG. 17	,, ,,	,,	5·78. 5·72 × 5·74	32·83	132,340	4,031	259	188,840	5,752	369	237,180	7,22
633	,,	,, ,,	,,	5·68. 5·70 × 5·70	32·49	138,120	4,251	273	159,730	4,916	316	163,110	5,02
637	CT. 16	,, ,,	,,	6·00. 5·68 × 6·21	35·27	128,150	3,633	233	184,240	5,224	335	222,870	6,31
636	,,	,, ,,	,,	5·90. 6·10 × 5·76	35·13	122,350	3,482	223	176,730	5,031	323	183,820	5,23
635	CA. 14	,, ,,	,,	5·95. 5·85 × 5·80	33·93	133,630	3,938	254	168,110	4,954	318	189,520	5,58
634	,,	,, ,,	,,	5·95. 5·85 × 5·80	33·93	127,150	3,747	240	154,560	4,555	292	176,840	5,21
645	MG. 1	Hollow, filled †	B	6·20. 11·60 × 5·70	66·12	46,340	701	45	74,220	1,122	72	168,610	2,55
646	,,	,, empty	,,	6·20. 11·46 × 5·70	65·32	22,340	342	22	39,720	608	39	80,840	1,23
650	CT. 3	,, filled †	,,	6·30. 11·70 × 5·80	67·86	26,250	386	24	54,370	801	51	130,260	1,91
649	,,	,, empty	,,	6·25. 11·55 × 5·85	67·56	33,850	353	22	43,630	645	41	69,350	1,02
648	CA. 2	,, filled †	,,	6·25. 11·70 × 5·80	67·86	54,120	797	51	84,180	1,240	79	126,970	1,87
647	,,	,, empty	,,	6·10. 11·70 × 5·80	67·86	26,740	396	25	44,920	662	42	64,380	9
656	MG. 9	,, empty	C	5·75. 11·55 × 6·72	77·61	56,540	728	46	178,960	2,305	148	224,750	2,89
655	,,	,, empty	,,	5·70. 11·55 × 6·90	79·69	54,370	682	43	166,220	2,085	134	218,630	2,74
652	No. 2. 4	,, filled †	,,	5·73. 11·70 × 6·90	80·73	108,100	1,339	86	130,270	1,613	103	148,140	1,83
651	,,	,, empty	,,	5·75. 11·66 × 6·90	80·45	53,330	662	42	90,110	1,120	72	127,950	1,59
654	CT. 5	,, filled †	,,	5·70. 11·60 × 6·90	80·04	54,830	685	44	118,220	1,477	94	134,510	1,68
653	,,	,, empty	,,	5·80. 11·60 × 7·00	81·20	48,680	599	38	60,870	749	48	94,160	1,15
669	23	Solid	D	2·45. 3·40 × 3·85	13·09	174,120	13,302	855	181,840	13,891	893	188,120	14,37
670	22	,,	,,	2·80. 3·40 × 3·85	13·09	53,110	4,057	260	64,330	4,914	316	66,560	5,08
674	27	,,	E	4·70. 5·10 × 2·00	10·20	21,635	2,121	136	51,550	5,054	325	84,380	8,27
673	28	,,	F	2·70. 6·50 × 3·32	21·58	60,530	2,805	180	96,280	4,461	287	117,290	5,43
671	Red 20	Nearly Solid	G	2·70. 9·00 × 4·12	37·08	72,250	1,948	125	98,320	2,651	171	119,870	3,23
672	26	,, ,,	H	4·10. 8·10 × 1·60	12·96	31,220	2,409	154	33,610	2,593	166	34,840	2,68

† Space filled with Roman-Cement.

Woodcuts Scale

A

B



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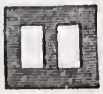
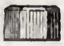
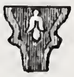


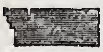
D



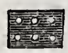
E



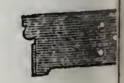
F



G



H



J. M. BLASHFIELD,
STAMFORD, LINCOLNSHIRE.

X ERIMENTS

R A-COTTA, MANUFACTURED BY, AND RECEIVED FROM, J. M. BLASHFIELD, STAMFORD ;
N , AND COMMON STOCK BRICK.

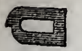
E O -QUARTER INCH THICK.

ST O.	ARKED.	DESCRIPTION.	WOODCUT.	DIMENSIONS.	BASE AREA.	CRACKED SLIGHTLY.			CRACKED GENERALLY.			CRUSHED.		
						Total.	Per square inch.	Per square foot.	Total.	Per square inch.	Per square foot.	Total.	Per square inch.	Per square foot.
				H. L. B.	Sq.inch.	lbs.	lbs.	Tons.	lbs.	lbs.	Tons.	lbs.	lbs.	Tons.
34	o. 2. 6	Hollow, filled †	J	2·90. 11·90 × 3·50	41·65	47,060	1,130	72	74,140	1,732	111	146,730	3,523	228
33	,,	,, empty	,,	2·90. 11·90 × 3·50	41·65	15,525	372	23	21,567	518	33	66,470	1,596	103
58	G. 7	,, filled †	,,	2·85. 11·80 × 3·50	41·30	49,418	1,196	77	116,100	2,811	181	133,450	3,231	207
57	,,	,, empty	,,	2·85. 11·80 × 3·50	41·30	16,685	403	25	24,455	592	38	70,775	1,713	110
60	A. 10	,, ,,	,,	2·90. 11·90 × 3·50	41·65	10,630	255	16	17,040	409	26	59,115	1,419	91
59	,,	,, ,,	,,	2·90. 11·85 × 3·50	41·48	9,710	234	15	15,680	378	24	54,370	1,310	84
32	T. 9	,, ,,	,,	2·87. 11·90 × 3·50	41·65	7,160	171	11	13,110	314	20	53,550	1,285	82
61	,,	,, ,,	,,	2·87. 11·90 × 3·50	41·65	6,305	151	10	12,938	262	17	34,715	833	53
68	C. 8	,, filled †	K	2·90. 11·70 × 4·00	46·80	36,555	782	50	70,415	1,504	97	118,350	2,529	162
67	,,	,, empty	,,	2·90. 11·70 × 4·00	46·80	3,342	71	4	7,810	167	10	31,208	666	43
65	A. 13	,, ,,	,,	3·10. 11·85 × 4·00	47·40	6,655	140	9	19,880	419	27	35,420	747	48
66	,,	,, ,,	,,	3·10. 11·85 × 4·00	47·40	6,178	130	8	14,844	313	20	31,980	675	43
40	G. 11	Column	L	11·90. 6·60 dia.	34·19	163,122	4,774	307	222,610	6,511	418	258,370	7,572	486
41	,,	,,	,,	12·00. 6·56 dia.	33·82	131,820	* 3,898	250	143,650	* 4,247	273	167,880	• 4,964	319
2	A. 12	,,	,,	12·00. 6·60 dia.	34·19	128,530	3,759	241	181,760	5,316	342	212,580	6,218	399
3	,,	,,	,,	11·95. 6·60 dia.	34·19	44,840	* 1,311	84	68,720	* 2,010	129	88,940	• 2,601	167
4	ed 24	,,	,,	15·50. 6·00 dia.	28·27	108,170	3,826	246	123,620	4,373	281	137,570	4,866	312
7	19	Hollow, empty	M	5·50. 18·00 × 9·70	174·60	44,120	252	16	67,540	387	25	99,880	572	67
5	21	Solid	N	1·00. 6·10 × 6·00	36·60	386,350	10,556	679	......	....		......	....	
6		Portland Stone.	A	6·00. 5·95 × 5·80	34·51	151,280	4,401	283	156,820	4,544	292	156,820	4,544	292
5		,, ,,	,,	6·00. 5·95 × 5·85	34·80	150,750	4,332	278	155,540	4,470	287	155,540	4,470	287
8		Bath ,,	,,	5·92. 6·00 × 5·88	35·28	48,120	1,364	88	57,270	1,623	104	57,270	1,623	104
7		,, ,,	,,	6·00. 5·90 × 5·90	34·81	45,270	1,305	84	54,880	1,576	101	54,880	1,576	101
		Common Stock Brick.	O	2·50. 9·10 × 4 12	37·49	10,110	270	17	28,660	764	49	47,840	1,276	82
		,, ,, ,,	,,	2·50. 9·00 × 4·20	37·80	8,160	216	14	24,220	641	41	44,240	1,170	75

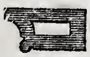
t foot.

* Fracture shews defective moulding.

J



K



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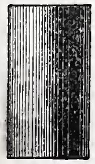

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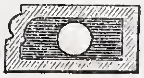


N

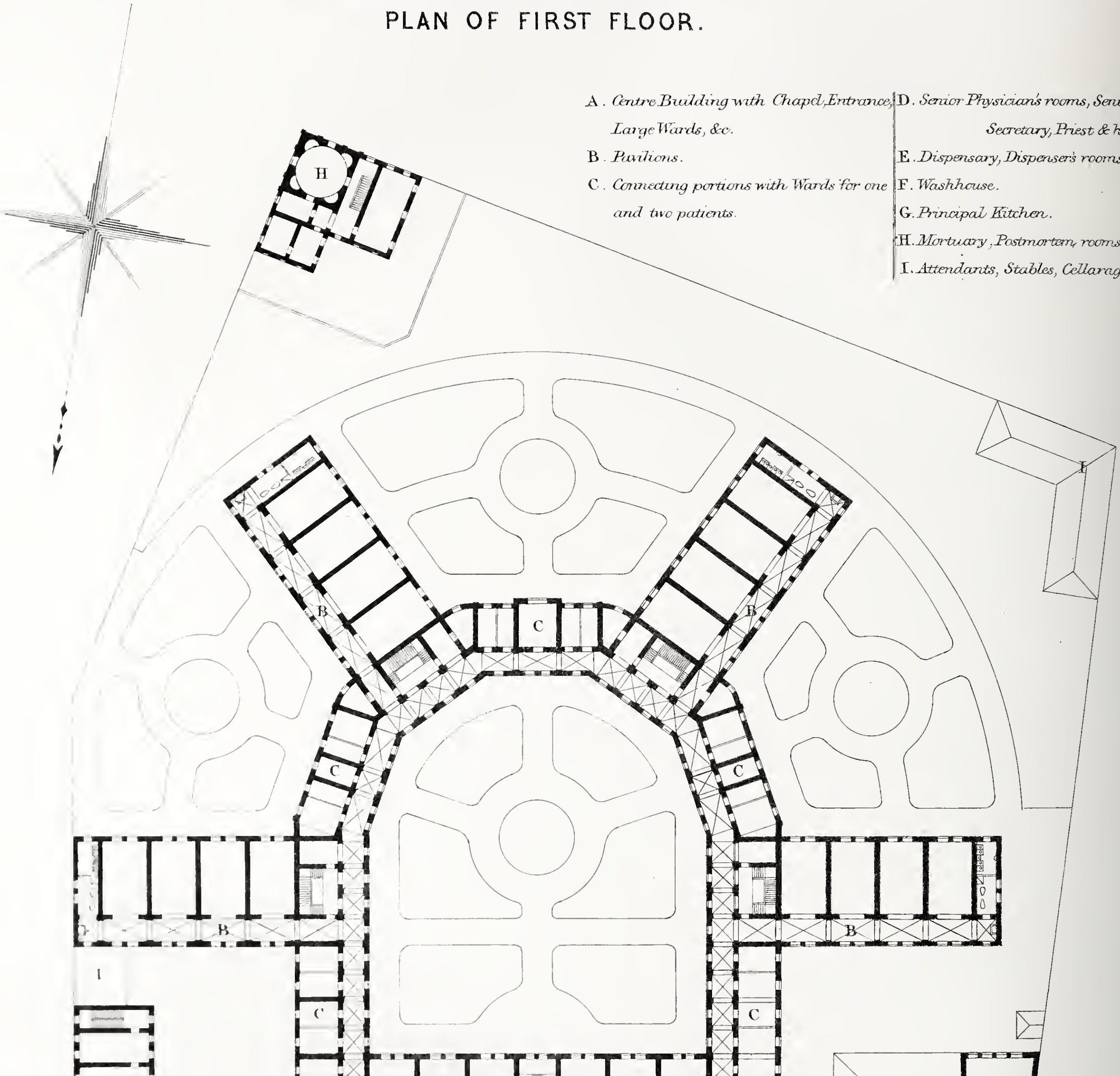
O

TESTING AND EXPERIMENTING WORKS,
THE GROVE, SOUTHWARK STREET, 17TH JUNE 1868.
DAVID KIRKALDY.

ALEXANDROW HOSPITAL.

PLAN OF FIRST FLOOR.

- A. *Centre Building with Chapel, Entrance, Large Wards, &c.*
- B. *Pavilions.*
- C. *Connecting portions with Wards for one and two patients.*
- D. *Senior Physician's rooms, Senior Surgeon, Secretary, Priest & his Clerk.*
- E. *Dispensary, Dispenser's rooms, Assistants, &c.*
- F. *Washhouse.*
- G. *Principal Kitchen.*
- H. *Mortuary, Postmortem rooms.*
- I. *Attendants, Stables, Cellarage.*



Scale of Feet

Lithographed for the R I B A by Kell Br.s Castle St London E C

A SHORT DESCRIPTION OF THE PLANS OF HOSPITALS AT PARIS, MUNICH AND ST. PETERSBURGH.

By Dr. Oppert.

You have recently heard an interesting paper, in which the author took you to India; I shall confine my remarks to Europe, and to the plans of the hospitals exhibited in this room. They will, however, afford me an opportunity for making some general observations on warming and ventilation. I selected these plans from others because the buildings they refer to were all considered model buildings at the time they were opened, and an historical interest is connected with them. They are representatives of certain styles of building, though many others are found in existence. The corridor hospital, built in the quadrangle form, with closed yards, is represented by the Munich hospital, the pure pavilion plan by the Lariboisière, and the corridor system combined with the pavilion plan by the Petersburgh hospital. I consider the latter especially worthy your notice, as novel, peculiar, and a great improvement on the existing style of building in Russia. You find the same plan in the recently opened Rudolphstiftung, in Vienna, and a little less developed in the Copenhagen hospital; as also in some lunatic asylums. It is averred by those who are the leading men in such matters at the above-named cities that the climate does not allow the adoption of the pavilion plan *pur et simple*. You will observe the advantages of the pavilion plan as regards the isolation of wards from each other, and that the free circulation of air through or across the wards is obtained in a great measure.

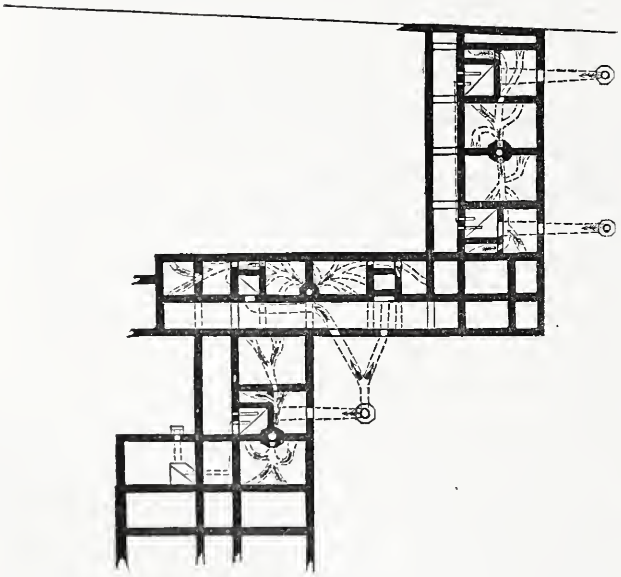
The Alexandrow Hospital was founded in remembrance of the birth of an Imperial Prince of the same name, and opened a little more than a year ago. Its site is near a flowing river, the Fontanka, and it is destined to accommodate 800 patients, but there are only 350 in it now. The buildings stand around a large yard, half-moon shaped, at the further end, and there are two and three floors over a low basement. The chapel is placed in front, in the centre, the two pavilions at each side of the entrance serve for private dwellings and administrative purposes. A large number of rooms for one and two patients are arranged so as to open into the common corridor. The large wards contain twelve beds, six on each long side, and two large windows are opposite the entrance. The cubic space for each patient is about 1300 feet. The wards may be ventilated by opening the windows, the door and the windows of the corridor directly opposite. There are baths, lifts, tea kitchens, and water closets.

Water is laid on to all parts of the building, and there is accommodation for 200 servants, attendants and nurses. This is double the proportion usually provided elsewhere. The grounds are laid out in gardens, and the usual outbuildings, kitchen, &c., are detached.

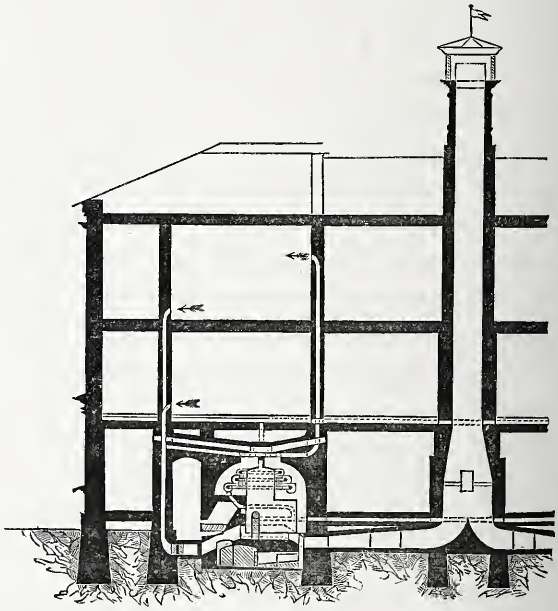
The Munich general hospital was founded in 1808, by the late King Ludwig of Bavaria, who embellished the city with so many beautiful structures; but this one is, according to our present notions of sanitary science, a singular failure, though intended for a model in every respect. Its site is splendid, the grounds are spacious, the outbuildings conveniently arranged, and the hospital has a pleasing exterior. It accommodates 500 patients when full, but it is often emptied of part of its inhabitants, for which reason a new hospital, containing 100 beds, was constructed, and opened two years ago. It stands in close proximity to the other. The female patients are on one side of the building, the males on the other; the connecting transverse buildings contain offices, kitchen, and rooms for private patients, who pay a small sum of money weekly. Stairs, walls, floors, and other arrangements are very commendable. The nurses' rooms are badly placed, being squeezed between the wards and corridors, so that they are dark and impede the ventilation of the wards. It was intended to isolate the wards more completely, by placing them in this manner, but no architect would now construct a hospital on this principle.

The construction of the Lariboisière Hospital is sufficiently known, so that I need not describe it;

and I may at once venture to compare the warming and ventilation of the three buildings. In Russian establishments chimney fires are very rare; German tile stoves are a little more frequent; petchkas and smokepipes often serve for warming. This system is similar to the old Roman hypocaustum, a set of flues running beneath the flooring, and conveying the smoke and hot air from a furnace outside the room. The ancient kang of the Chinese is arranged exactly on the same plan. The Russian stoves are usually placed in the basement, and hence the flues carry the heat to every room. This system is economical, and very effective in cold climates, but I know that the air often becomes close. The flues are moreover not used for ventilation. The following systems of warming and ventilation are now in action at the Alexandrow Hospital: On one side of the building the heating is by hot air, a hot water apparatus is placed in a hot air chamber in the basement, and the warm air ascends hence to the wards, where it enters through openings placed near the ceiling; the furnace which heats the apparatus and the chimney flue are used for extracting the vitiated air from the wards, and the openings of the foul air channels are near the floor. On the other side of the building the warming is by water circulating in pipes and stoves; the corridors are warmed by steam.



Plan showing the Admission of Air from Outside, and System of Hot Flues.



Section through Wards showing the Hot Water Apparatus, and System of Admission of Fresh Air and Extraction of Foul Air.

An historical interest is attached to the system of warming and ventilation in the Munich hospitals. I do not believe that any artificial means of ventilation of hospitals were known up to the beginning of this century, except apertures in the ceilings. These were used already in the year 1740 in English hospitals.* Louvres over doors and removable casements of the lower parts of the doors were also known in France about 1780; but a system of completely and altogether replacing the natural ventilation by artificial means, was first recommended, by Hæberle, fifty-seven years ago, for the Munich Hospital. This gentleman was the director of the hospital and member of the council of health. He thought it possible to supply the required air to the patients artificially, withdrawing the impure air at the same time. Now, every one knows at present that this is quite impossible, and the system had to be altered. Artificial systems came altogether into discredit by the frequent failures of similar plans.

We find two air towers in the Munich Hospital—one on the male side, the other on the female—intended for the continuous entrance of fresh air by the action of the atmospheric pressure. In addition, the air enters through horizontal trunks laid beneath the roofs. The fresh air is warmed in winter time by passing over vertical smoke pipes, which are surrounded by perforated ornamental porcelain, forming stoves. It was the intention to remove the foul air of the wards by channels leading to the furnaces. These are on the ground floor, and the channels from the upper wards were laid through the side walls. Most of them had to be blocked up.

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* In 1744 the celebrated Benjamin Franklin suggested the insertion of an aperture in the flue near the ceiling. He had it arranged with a small shutter over his Pennsylvanian fire-place.

The modified artificial system is still in action in three Munich hospitals, one of which—the Lying-in Hospital—was opened twelve years ago, but the stoves are heated separately on each floor. Another is the already mentioned supplementary hospital, where it is introduced with Dr. Böhm's modification. Pettenkofer made his memorable experiments in the General Hospital and the Lying-in Hospital. It is now ten years since they were made, but they are still worth relating. Pettenkofer used the anemometer, a little instrument which has four sails, easily put in motion by slight air currents, where each turn is registered by an index. He also employed simpler means, such as scraps of paper suspended in the air channels; he had small double glass doors placed in the latter. He showed the permeability through the walls by blowing out a candle through them; for this purpose some bricks were removed and encased in metal before being replaced, and short tubes inserted in the outer surface opposite each other. Dr. Böhm's arrangement was first introduced in a hospital of Vienna (the first army-corps). The air which warms the wards has to pass water stoves first outside, and afterwards inside the wards. Anemometers are placed permanently in the foul-air channels behind glass, to indicate the air current.

I just mention the average results of 220 experiments made during a week's time by Pettenkofer in the Lying-in Hospital. The air moved in the desired direction 58 times, was stagnant 25 times, and moved in a direction opposite to the desired one 17 times in a hundred. It was also proved that foul air was drawn back from one ward into another.

Similar experiences were made in Lariboisière about the same time. The systems of warming and ventilation of this hospital are, however, more generally known. The pavilions on one side are warmed by water circulating in pipes,* and the foul air is extracted through the action of large hot water tanks. They do the duty which the fire was intended to do in Munich. On the male side we find water stoves, the fluid being warmed by coils of steam-pipes, and the air is forced in by a ventilator. I was always of opinion that from a sanitary point of view the system of forcing-in the air deserves the preference over the method of extraction; but there are other points to be considered. I also believe, from my own investigations, that the alleged disastrous results as deduced from the mortality were greatly exaggerated.

Hospitals provided with elaborate systems for ventilation generally require scientific supervision. Should government-inspectors be entrusted with reporting on their sanitary condition, they should possess a certain knowledge of the means for testing the air. It is also important that they should be aware of the great difference of the air at different times of the day and night. I need scarcely say that the impurity of the air of the wards may be owing to many other causes besides defective ventilation, such as want of cleanliness. The sense of smell rarely misleads; but it should not be forgotten that those who live in a building get much used to its atmosphere. Nor would one be so well qualified to judge of the air by his organ of smell at the end of an extended inspection as at the commencement.

The three hospitals are under rules for administration which differ from the English plan. There is a director instead of a committee, and he lives on the premises. He is under a government Board. In Munich and Petersburgh a medical man is usually appointed; in Paris an official. No matrons are found, but a steward attends to their functions. In Munich and Paris the nursery is in the hands of religious catholic sisters; in Petersburgh a great many male attendants are found, and married couples.

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* This system was invented by Bonnemain (1777), modified and introduced in England by Price (1829), and greatly improved by Duvoir of Paris (1840).

Mr. Edwin Nash inquired whether the author of this paper was the medical gentleman that accompanied a Russian architect, who he understood had visited several of the hospitals in London, for the purpose of gathering information. He understood those gentlemen had visited the works of the New St. Thomas's Hospital that day.

The Chairman remarked that Dr. Oppert was known to them as one of the Physicians to the City Dispensary, and had been referred to as an amateur in what he had done and written on the subject.

Mr. E. C. Robins, Fellow, said he had listened with much pleasure to the interesting paper just read, more especially because he had become acquainted with Dr. Oppert's careful consideration of the subject through the work on "Hospitals, English and Foreign," which Dr. Oppert has recently published, a copy of which he (Mr. Robins), had had the satisfaction of presenting to the Institute that evening. The work not only contained descriptions and plans of a great variety of the most interesting and important hospitals, but it also presented us with the opinions of the author on all the parts comprising such buildings, and the special uses for which they should be designed, and was therefore a valuable "aide mémoire" to the architect engaged in their erection. He would, however, be glad to see in the next edition of the work, Dr. Oppert's opinion with reference to the amount of storage and cellar room required. Dr. Parkes in his work on "Hospital Hygiene," seems to indicate a larger proportion of space for patients than was usually provided, thus

"*Table of Storage required for every* 100 *Sick.*

Bedding	200 square feet.	Provisions	100 square feet.
Clothing	100 ,,	Fuel	250 ,,
Utensils	200 ,,	Linen	120 ,,

Pack Store........................ 200 square feet."

Dr. Oppert said he was not officially connected with the Russian Government. It was quite correct that that government had commissioned an architect and medical men to visit different countries in order to study the architectural arrangements of hospital buildings. In reference to a remark that in the work which he had published on "Hospital Plans, &c.," there was very little information given as to the quantity of storage room required for hospitals. He was aware that his book was defective in several points, and he was obliged to the gentleman who had drawn attention to it. He had not said much about the stores, but he had given a general view of existing buildings.

Mr. T. Roger Smith remarked that Dr. Oppert had opened the most important question of all—viz. ventilation. They were apt to believe that if they made hospital wards with a large number of windows opposite to each other, they had done all that was necessary. In some continental hospitals that had gone to an extreme, and the whole of the ventilation was performed by artificial means. It seemed that a combination of natural and artificial ventilation would be good. He should be glad to hear whether ventilation assisted by artificial means had been successfully carried out.

Dr. Oppert observed that the question of ventilation was a very important one, and had been discussed, perhaps, more than any other; the opinions about natural and artificial ventilation had especially had full vent at different times. He agreed that it was not well to trust too much to one or the other. But with regard to hospital ventilation in this country, there were greater opportunities for natural ventilation than was the case in countries with a much higher or lower temperature of the atmosphere. As far as his own experience went, in many cases it was desirable to use artificial ventilation as supplementary. He could not recommend a model plan for every building. He dared say a good deal depended upon circumstances over which the architect had no control, such as the amount to be expended, &c.; but in any given case he thought it always well for those who built hospitals to have the opinion of medical men who had paid a great deal of attention to the subject of ventilation.

A vote of thanks was then passed to Dr. Oppert for his paper.

PAPERS

READ BEFORE

Various Scientific and Literary Societies.

BY

THOMAS HAYTER LEWIS, F.S.A.,
PROFESSOR OF ARCHITECTURE TO UNIVERSITY COLLEGE, LONDON; AND VICE-PRESIDENT OF THE
ROYAL INSTITUTE OF BRITISH ARCHITECTS.

1866.

after that was added that of Teyloun, at Cairo, still almost perfect as its builders left it; one hundred years later came the great University of El Azhar; and very soon afterwards the bold gateways to the north of Cairo. So that we have here an almost unmixed race, suddenly appearing and becoming temple builders, the exact dates of their appearance and of the building known, and the buildings themselves left to us; and if the history of any style in art could be defined for its beginning, we might hope to find such clearness here. I shall not weary you with an abstruse inquiry into the origin of the Saracenic style; but in these times, when we are awakening to the thought that a style, to be national, must have grown up with the nation's growth, and become identified with it by association and tradition, it may not be uninteresting to examine a little whether these Arabs, who, till their decay, carried with them their architecture, through all the countries which they conquered, brought it with them from their deserts at the period of their conquests, or acquired and rapidly appropriated it from others. First, as to the name. It may be as well to remind you that the Saracens had as little to do with the style called after them as the Goths had with our Gothic. The Saracens were of an obscure tribe, known only by name in history, until the Arabs took that name, and made it famous; and the Turks were even a more distant importation from near the Caspian Sea.

The Saracenic style is essentially Arabic, practised only by the Arabs, and those under them for centuries; and if it have a definite national birth-place at all, we must look for it in their home—Arabia.

Our first inquiry must then be, What was the state of art there? Can we find in it the origin of the leading features of the style, the porticoed mosque, the minaret, the dome, the pointed arch, and the ornaments now so peculiar to it? For our knowledge as to the primitive state of art in this country of Mahomed, we naturally turn, as our first authority, to the Koran, and very significant is its silence upon the whole question. There are not, I think, in the whole 114 chapters, more than half a dozen passages referring in any way whatever to the buildings of the time, and even these in the vaguest way.

If there be anything more tangible, it has escaped not only my own notice in a tolerably careful search, but that of the scrutinizing eye of Mr. Fergusson, who, in his "Handbook," alludes to the fact.

We then turn to the sacred buildings of Arabia, whose dates are tolerably well known, but the result is there equally disappointing.

The mosques of Mecca and Medina are clearly shown to have been originally very small, repeatedly destroyed by fire and tempest, and rebuilt in later times, and on a grander scale in each restoration; the mosques at Mecca having been reconstructed almost entirely in 705 by El Walid, and again in the beginning of the fifteenth century by Sultan Boorhank, of Egypt, and that of Medina, by Kaid Bey of Egypt, in the sixteenth.

But so many restorations and alterations have since been made, that these mosques may be to a great extent considered as modern structures.

Of one thing, however, we may be tolerably certain, viz. that within a very few years after Mahomed's time, the Arabs used the present plan of the cloistered mosque, and somewhat of the present form of the minaret; but it would seem that this latter picturesque feature was not used *in his* time, as the call to prayers was then made from the roof of the mosque, and not, as afterwards, from a tower. Failing in our application to the Koran, and to the mosques, we turn to the earlier writers of the time, whose works as to these points have been carefully investigated, and the existing remains studied and drawn by M. Girault de Prangey, M. Coste, Mr. Owen Jones, Mr. Fergusson, and others.

All early writers preserve a most significant silence as to the state of art before the Mahomedan era, but record the events within the century after it, which give us a clue at once towards the truth. For in the history of almost every building of importance, between the end of the first century after Mahomed and the middle of the tenth, we find that workmen, artists, materials, and architects, were brought from abroad to execute them. Sometimes Greeks, sometimes Copts,—once, I think, an Abyssinian,—are mentioned; in some cases from Constantinople, in others from Bagdad But the fact of the foreigner is always the same, whether in Arabia, in Egypt, or in Spain. Thus, in the rebuilding of the Medina Mosque, by El Walid, in the early part of the eighth century, it is recorded that the Greek Emperor sent him forty Greek and forty Coptic artists to do the mosaics and carve the marble columns; also two Greek architects to embellish the mosques of Damascus and Jerusalem; and for the palace of Zahra in Spain, built in the middle of the tenth century, the sovereign sent for the most skilful architects from Constantinople and Bagdad.

When the Mosque Teyloun at Cairo was built, in 876, the Sultan possessed himself of a Christian architect, whom he clapped in prison, to give him, I presume, the advantage of retirement in preparing his design.

Sometimes assistance was procured in a similar way, but by still more unscrupulous means; for we find that in one case the ambitious sovereign, thinking, perhaps, that the end would justify the means, seized a vessel which had been wrecked in the Red Sea, conveying workmen, materials, and two architects, for the erection of a Christian church, and very coolly appropriated the whole (the architects included) in order to assist in constructing his own mosque.

All this seems to show very clearly that the Arabs had, nearly to the end of the first century at least of their era, no definite architecture of their own, and that we must look abroad for the germs of their style. In the Teyloun, at Cairo, 876, we have it perfected: so it is between these two dates that we must watch for its development.

First, then, with respect to the general plan of their earliest buildings, the mosques: that of Mena, measured by Ali Bey, the accuracy of whose plan is admitted by Burckhardt and Lieut. Burton, though it differs considerably from that given in Sale's Koran, is identical with that of Amrou and Teyloun in Cairo; the Meccan mosque dating from the seventh century, those at Cairo from the seventh and ninth centuries, the general outline in each being that of a large open space surrounded by porticos and containing in the centre a fountain, reservoir in other building. The idea seems so completely to give what was wanted, so arising from the necessity of the case, that we need scarcely search for its style in any part of the Basilican arrangement.

A large space of ground was inclosed for sacred purposes, and the most obvious arrangement was to surround the walls with a colonnade, forming, in fact, a cloister; and, when this was done, and a fountain added in the centre, and a minaret or so at the angles, or wherever else it could best be placed, the primeval mosque was finished.

But the domes, the minarets, and the other details are too artistic in their treatment for the same reasoning to hold good with them; and for their origin we must turn to the countries from which the Greek, the Copt, and the man of Bagdad came.

Of these the first in rank and the best known are the Greeks of the lower empire and Constantinople, and of these we possess extensive works erected in different countries and of known dates, with which to compare those of Egypt and Spain. At about the same distance only from Constantinople that Cairo is lies Ravenna, the seat of the Greek Exarchs, and well known in the history of art by its church of Saint Vitale, erected by Justinian, and filled with mosaics and other works of his time.

Take now the mosque Teyloun, at Cairo, as a standard, and compare it with that of St. Vitale, so well known to you, and you will see how totally different is its character. In St. Vitale, some centuries earlier than the Teyloun, you have the well-defined Greek capital, and that style of carving almost detached from the bell so peculiar to the lower Greek empire.

Again, in Constantinople, whose remains have been so well preserved to us by the exertions of Saltzenburg's volume, the same character prevails. And neither in Ravenna nor Constantinople do we find the bold crest ornament, which shows so prominently at Cairo and Seville, and which forms so bold and picturesque a finish to the mosque of Teyloun and Kaid Bey, at Cairo; but we do find it in some of the palaces of Venice, whose buildings bear in part strong traces of Eastern art. I know also in the West no prototype of the minaret, unless it be, perhaps, the round old towers of uncertain date, that we find at Ravenna. But the era of Mahomed was a tower-building one, and the minaret seems to have been a natural result of the Arab form of worship.

According to Lieut. Burton, it dates from the end of the seventh century, and was originally of about the same form as those which are now used by the Turks, viz. circular or polygonal, with a single gallery near the top, and a pointed termination. If, however, the ruined mosque of Bozra, mentioned by Burckhardt, and again by Porter, be really as is imagined the work of Othman, we have a date earlier by some twenty years than the above, and very close to Mahomed's time.

Of the pointed and the horse-shoe arch, the homes are, no doubt, in the East, and the Arabs at once appropriated them, as may be seen in their earliest buildings, and used them almost to the exclusion of other forms.

There is one more subject, that of the decoration, and I think that the most ordinary observer must be struck with the great resemblance that the Arabic has to the common forms of ornament, to which we are accustomed in Eastern fabrics. But one peculiarity is very striking. I mean the great crest ornament to which I have before referred, and which fulfils the same condition in the Arab buildings as the great cornice does in the Italian, of giving a grand crowning mass to the whole front.

It is represented, to some extent, by the antefixæ of the Greek temples, but nothing of the sort nearer than this was, so far as I am aware, used in the West. But in the East, it seems to have been used as a common form of decoration, and even in the Assyrian sculptures from Nineveh we find it represented almost as the outline used in the mosques of Cairo.

Taking these various facts together, it seems that we must look upon the Arabs' style as having been founded chiefly upon an Eastern type, but with mosaics and other details from Byzantium, and that, modified according to their habits and their forms of worship, it was rapidly developed by them, until, within a century, they had formed it into a distinct style of their own.

I do not think that this Eastern origin is contradicted by the fact that the Greek emperors were constantly applied to for, and furnished in the earlier times, artists for the Arab works.

Coptic artists (who must have been Egyptian) were sent as well as Greeks.

Bagdad supplied architects as well as Byzantium; and when the Greeks from the latter city are especially mentioned, the accounts of their missions are always accompanied with notices of the carvings and mosaics that went with them—just what we should expect from the known fact that Constantinople was, for such objects, the workshop of the world, and quite reconcileable with the idea that these Greeks were sent to decorate the buildings, put up, perhaps, by quite a different class of men. But whatever the fact may be in that respect, I hold it to be clear that, with the exception of the isolated cases at Venice, whose traffic was so great with the East, no buildings of the same style, or with any of the marked characteristics of theirs, exist to the west of the countries conquered by the Moslem.

Considering, now, in detail, their buildings, we find them just such as we should expect from the history of their founders.

They burst forth suddenly into a rich country, inhabited by a race whose effeminate manners they despised, to whose lineage, manners, language, and very form of writing they were strangers, and whose religion was to them idolatry. To destroy the temples of the Christians, and on their site to erect the mosques of Mahomed, was a holy duty, and, with a few exceptions, the destruction of the churches was complete. Their numerous columns furnished abundant spoils for the long-cloistered mosques, and nearly all the earlier ones are thus found to have been constructed from the wrecks of the older works. The mosques of Omar at Jerusalem, founded in 637; of Amrou at Cairo, in 642; of Damascus, in 705; and of Cordova, in Spain, 786, were thus formed of columns of unequal size, and dissimilar capitals and bases.

Just in this same manner did the Christians before them build their churches, baptisteries, and basilicas, out of the ruins of the Pagan temples. Such easy quarries have been too tempting in every age. The Arabs, however, soon began to work for themselves, and in the Mosque Teyloun we find some good bold capitals, but looking very like an Arab rendering of an antique.

I am not, however, aware of any early example in Syria or Egypt of the well-known Saracenic form, so characteristic of Spain, and the best known examples of which in the Alhambra date from the fourteenth century, nor do I know the original type of them. Their skeleton form is that of the cushion capital, but rendered so elegantly, and adorned so gracefully, as to clear itself altogether from its type, and to have made itself quite an integral part of the style.

In Sicily we get a very elegant semi-Gothic form, and in Greece (conquered by the Othmans in the fifteenth century) the few remains are chiefly formed by an arrangement of the honeycomb ornament, found also in nearly all the Arab works elsewhere.

The history of the pointed arch has been so well investigated, that its Eastern origin may be considered as settled. In relation to our present subject, we find it used in the mosque of Amrou, near Cairo, in the middle of the seventh century, and it occurs in almost every Arab building in conjunction with the round arch. But this latter is, curiously enough, commonly used, as in the transition Gothic, in the smaller apertures, the large, bold arches being pointed. Thus in the mosque of Kaid Bey, the great arches under the lantern light are pointed, whilst the small lights in the gable of the dome are round; and in the Moristan two-light windows the enclosing arch is pointed, whilst the small arches within are round.

But we now come to other forms almost peculiar to this style, viz.—the horse-shoe and the large cusped arch, scarcely found in any other. We have, indeed, a few examples of the horse-shoe in our Gothic, as in the apse of Canterbury; they seem, however, to have been there almost accidental forms, and in no way characteristic of the style, and few of us would, I think, be bold enough to use such an outline with any prominence in the revival.

The cusping too, with us, is a mere ornamental appendage; but in the Saracenic, both the horse-shoe and the cusped arch are essential features of the design, and sometimes used, as at Cordova, with a recklessness that becomes almost unpleasing.

The earliest example with which I am acquainted is at Cordova. I am uncertain of the origin of the horse-shoe arch, but I can scarcely think it to be a form to be followed or admired. It seems to have been used from the earliest times by the Arabs, and is found in the mosques Amrou and Teyloun and others.

I apprehend that it is likely enough to have arisen, either from a wish to get a sort of corbel at the springing, or from the desire to get rid of the abrupt projection of the top of the capital beyond the line of arch, and that the arch was thus prolonged with a sweep inwards, to bring the whole into one unbroken curve.

The Gothic architects managed this in a different way, by bringing forward all the arch mouldings boldly beyond the line of column,—a way much I think to be preferred to the Saracenic, whose method can scarcely be called elegant, whilst it is constructionally bad. I may add, from some slight personal experience, that it is no easy matter to bring this form into harmonious keeping with others, and to get it to combine well with the other lines of architecture. Of the bold cusping, as seen in Cordova, I am not aware of any example in Egypt or Sicily, but they are very common in the Spanish remains. The windows are of such varied forms, that it is almost impossible to give any definite general description of them. In the private houses, the windows towards the streets are usually formed of wood, projecting boldly forwards over the street, the openings being filled in with wooden trellis or ornamental work. Towards the garden, they are used of all shapes and sizes; but the type may, perhaps, be considered to be that of the double light window, with a column in the centre, and pointed arches over, as nearly as possible like the simple arrangements in our English arcades. Something like the arrangement of the projecting windows may be seen still used at Palermo, a town abounding in very interesting remains of the Saracens, and where on the upper stories in many of the main streets, are great projecting trellised windows, much resembling those at Cairo.

In the mosques the original window seems to have been a mere wide pointed opening, filled in, as in that of Teyloun, with very beautifully carved pierced stonework.

In the Alhambra, and at Seville, they are generally single openings, not much ornamented, but made to form parts of a very picturesque arcade internally, by the use of columns between them; and, in Sicily, they are still more plain; but in Cairo, many of the later mosques have very elegantly formed windows of double or triple lights, divided by detached columns, and enclosed in a pointed arch.

You may see some good examples in the mosques of Barkauk, Kaid Bey, and the Moristan.

In nearly all of the Caireen, also, at the upper part of the walls, just under the drum of the dome, we find an arrangement of triple windows, with circular lights over, as you may see also in the above-named mosques, and which have so completely within them the germs of the Gothic tracery, that we might, at first sight, almost take them for its prototype; but I feel no doubt that the arrangement is merely the result of a desire to adapt the general outline of the openings to the filling in of the gables.

In the minarets another form is constantly used, consisting of a pointed arch, with a sort of niche head, tilted up very high above the capital of a large edge column. You may see them in mosques El Moyed, Azhar, Kaid Bey, and others. The doors were subjects of much greater care and decoration than the windows, and offer subjects for the most careful study. Take, for instance, the great door-ways of the Okel Kaid Bey at Cairo, which is, however, merely one out of many. The door itself is small, for the Arab architects, like the Gothic, were careful to prevent the inevitable disappointment that would result at entering from the open air, through a large doorway into their halls. No space, however great, would not be dwarfed by it. But they wanted external grandeur too, and they got it in the most ingenious way.

The richly decorated doorway is enclosed within a great recess, itself having a bold moulding round it, and above the inner doorway a couple of cross niches bring the square plan gradually into a curve, and the whole is finished by another arch at top, forming a sort of grand trefoil.

The small doorways, too, are perfect models for study. They usually had an edge shaft: from this an arch sprang: and an exceedingly wide and ornamented archivolt was enclosed by an equally enriched square head. Sometimes a series of mouldings enclosed the whole composition, down to the ground in a square form. The arcades in the great mosques, where, from the great space and size, we should expect to find a grand effect produced, are somewhat disappointing. We get long ranges of columns and arches, but no fine composition or massing of the whole together; not even a combination of twos or threes. In the Mosque Teyloun, indeed, we have piers instead of columns; but the usual forms are merely so many arches and columns in a row, without even a bold cornice over them to give an air of richness to the lines. But in Spain the arcades are sometimes beautifully managed; and, by making the openings of unequal size and height, sometimes coupling the columns, sometimes raising the whole mass in the centre, and crowning the whole with a bold cornice, a most picturesque effect is gained. Cover the plain surface of the mass above the columns with the most delicate and graceful ornament, profusely decorated by these masters in the art of colouring, and you have an effect never, I imagine, surpassed. In many places the composition is added to and, perhaps, improved by the addition of an upper story, likewise arcaded. The cloisters of the Mediæval churches, such as the Lateran, Monreale, and others of that type, together with many of the Gothic cloisters, may equal these in design; but I know of no other composition that does.

The ceilings of the houses naturally followed the line of the flat roof of the Eastern houses, and were commonly formed of wood. Where no great amount of decoration was intended the rafters were often shown, a rich effect being produced by a bold bracket at each end, whilst the spaces between the joists were strongly coloured. The ceilings were, however, very often enriched in a very elaborate way by ornamental work raised on the flat surface by wooden ribs in the geometrical patterns, as seen in their pierced stone and tile work. The whole being gorgeously coloured and gilt. The very Gothic spirit of this will be at once recognized. In the mosques there was no necessity for the flat roofs, and the ceilings there were usually formed of a series of small domes, one over each compartment between the columns: and it is rather singular that in this arrangement the dome was usually formed with the regular pendentives to which we are accustomed in modern work, and which are scarcely ever found used by the Arabs in their larger works. These small domes were usually formed of brick, and left undecorated.

In the larger domes and the niche heads we find the honeycomb ornament largely used, more, however, in Egypt and Spain than in Sicily. In the latter country (although it contains some good specimens of the honeycomb work) the more usual plan was to bring out the pendentives by a series of arches, gradually increasing very much, as shown in Angoulême. The dates of the buildings here, however, are very doubtful. Mr. Fergusson attributes the chief of them, viz., the Cuba and C. di Ziza, to the twelfth century. Signor Cavallari, who had, I believe, the lion's share in the great work of the D. di Serradifalco, told me that he considered them to be very much earlier, and of the ninth century. In many cases they are, no doubt, by Saracenic architects. Mr. Fergusson suggests that the origin of the singular and characteristic ornament,—the honeycomb, to which I have just alluded,—may have been such an arrangement as is shown in the sketch of Delhi. It would seem, from some of the first instances in which it is found (viz., at the Cuba in Sicily, and Teyloun in Cairo), to have been suggested by the idea of very small arches cutting off the angle of the square base, and sustaining corbels, which carried other and still more projecting arches above, in the same way as I have described to have been practised on a large scale in Sicily. Row upon row of arches was then added, each overhanging more, and thus the pendentive outline was filled up.

Then, in later copies, these corbels were made to carry two or three arches, combined together like a trefoiled niche-head, as is seen on a great scale in the doorways of El Moyed and others, as I have just explained; and this form again, in after times, expanded into the complicated one, so well known in the Alhambra, in which all ideas of construction are completely lost, and the whole resembles one immense but regular mass of stalactites. Gorgeously coloured as these masses were, and used in combination with stained glass in the windows, marble mosaiced floors, and walls covered with the beautiful tiles, whose use for such purposes we are only now beginning to appreciate, they realized in common life the splendour which the wild dreams of an Eastern poet could scarcely have surpassed in fancy. The forms of these works are complicated in the extreme. Even the most simple are very difficult to master; and I speak from some experience in sketching them, when I say that more puzzling subjects even than they can scarcely be found. But to master the intricacies of the later style, where no leading lines exist, or even to bring oneself to comprehend the general idea of the composition, requires more patience and greater skill than most possess. It is a marvel to me, although I had the pleasure of seeing him engaged in the task, that Mr. Owen Jones should have managed to get his workmen to give such a life-like copy of the Alhambra work as that at the Crystal Palace. By the aid, however, of this singular ornament, the Arabs were able to lead the round or the octagon form out of the square, and, in fact, to make any change of form they chose, without a harsh line at the junction. They used it with admirable skill, but never greater than in forming the substructure, internally, of their domes, whose beautiful forms, so common in Mediæval times, so seldom used in our own, were decorated by the Arabs in a way, to my mind, unsurpassed. Their architects did not break up the grand, simple line of the vault by compositions whose lines were utterly foreign to it, as Thornhill (*not* an architect) was unfortunately allowed to do at St. Paul's; but they took the general outline of the dome, and at the more prominent parts carried round a series of beautiful ornamentation, almost flat, but relieved by colour, the greater part of the surface being left plain. Except at the base, they used scarcely any mouldings, and even these had very slight projections. The detail of the ornament was very beautiful, but so arranged as to combine in one general mass, and not to break up the surface into detached pieces; and whatever opinion there may be as to the other ways of treating it, there can be none, I think, as to the great beauty of the Arab, and that the ordinary coffered vault is a poor and tasteless substitute for their enrichment.

I must notice the stained-glass windows, as they are of very singular construction. The spaces for light are very small, and resemble pierced stone work; but the tracery is, in reality, composed of plaster, disposed generally, as in the Alhambra, in geometrical patterns. Often, however, as in Cairo, the pattern takes the form of a vase of flowers, or other similar subject, the flowers being, of course, represented by different coloured glass. The tracery bars are very thick, so that the actual glass is not seen at all, except in a front view; but the colour is thrown, by reflection, on the side of the bars, producing thereby a very striking effect, from every point of view.

I will now detain you a short time in alluding to a few features in the style, of external use only. They are mostly of no great interest; for, except in such works as Mosque Hassan, the pretty little mosques of the Marmoudiah, and of Kaid Bey, at Cairo, there are few buildings that form one well-arranged mass. The main feature relied on for effect was the crest ornament, which certainly breaks very effectively the sky line, and gives a rich finish to the front. It gives no idea of a battlement, but is purely ornamental. It is curious that the beauty in the composition of these buildings almost begins at the upper part. Below the cornice, the front, except in some few cases, as El Moyed, in Cairo, consist of little more than walls striped in red and white, with some slightly ornamental work for the doors and windows; but above the general line of the walls, the sky line was varied in the boldest and most graceful manner. In the treatment of this part, the minarets took a leading place. They sprang usually from a square base, and had two or three galleries, in the projection of which the honeycomb ornament was used with singularly good effect to form the corbelling which carried the square base into the round or octagon.

I have already alluded to the origin of the graceful minaret which, in all forms of elegance, adorns the cities of the Mahomedans, and certainly in these there is no want of boldness either in outline or construction. The dates of some of the finest in Egypt are about the same as the leaning tower of Pisa, and of Canterbury Cathedral, in England (that part which was the work of William of Sens).

In Greece there remains a few only. In fact, this beautiful country has been so wasted by war that it is a wonder only that anything has been preserved at all.

During several days' riding on the northern shores of the Gulf of Corinth (a part comparatively little known, and where several very interesting ruins remain, so far as I am aware, undescribed), I saw very few traces of the Turks. The few minarets were mostly of the forms described as those of the earlier times, with a single gallery.

The last and most important feature is the dome, and allow me to recur for a few moments to the way in which it was treated by other nations.

Among the Byzantines, and as seen at Ravenna, it is brought from the octagon into the circle by a series of small arches spanning the angles of the octagon, so as to bring it into a sixteen-sided figure, from which the circle is insensibly developed;—very much, in fact, in the way in which at the Greek-looking church of St. Aposteln at Cologne, at Mayence, and other Rhenish churches, the octagon dome is brought out of the square, or the circle brought out of the square at St. Ciriacco, at Ancona, and in the churches of Aquitaine (Angoulème, for instance), so well described by Mr. Petit.

In the Greek domes of Constantinople the circle is brought from the square by the gradual swelling out of the pendentive, as we are ourselves accustomed to do it. But in the works of the Arabs, the way in which the transition is arranged is in general totally different, as I shall hereafter describe.

Externally the difference in outline is very much greater, and, except St. Ciriacco at Ancona, I do not remember a single building, allied to the Greek, which resembles the Arab dome. The western outline was, and still to a great extent is, that shown in those drawings from Athens and Constantinople; shown remarkably in the Rhenish churches of the eleventh and twelfth centuries. The Greeks still cling to this old form. I saw a modern church at Patras, where the dome was made rudely enough indeed, but just like those I have mentioned. The few Mahomedan domes remaining in Greece follow, usually, the plan adopted in Sicily, and the niche heads are, as there, filled with the honeycomb ornament.

In Syria and Egypt there are, I believe, no remains of earlier work, but in Persia there are some of great interest; the palaces, viz., of Serbistan and Ferouzabad, of the fourth and fifth centuries. In each of these the chief feature is the dome, springing internally from a series of cross arches, in precisely the same way used in the Arab domes of Sicily. A great peculiarity here also is seen, in the way in which the light is introduced, through openings made, not only in the top of the domes, but also in small star-like forms throughout their whole surface, a plan which is used (I think *copied*) to a very great extent in the Arab works.

The Arab dome sprang, I think invariably, from a square base, both inside and out,—at least I remember no instance to the contrary. We all know the difficulty of leading the one form from the other, and, whether from this cause or not, there is scarcely, so far as I am aware, a single case of any Roman or Italian dome having been formed on a different plan from that of its sub-structure, where the change of form externally was boldly shown. Where, as in the great cathedrals, it sprang from a square base, the change of form was masked by the great roofs of the nave and transepts, the circle only appearing above. In the steeples of Sir C. Wren and his English followers (the only architects who have been successful in adapting the Gothic spire to Italian details), the change was hidden by an urn, or such like ornament at the angles. It scarcely seems quite a satisfactory way; and the Goths took a much more picturesque course. In their larger steeples and towers they carried up pinnacles, harmonizing in outline with those used in other parts of the building, uniting them by flying buttresses to the main work. Sometimes, though more rarely, a spirelet was carried up at each angle, as may be seen, for instance, at Sutton St. Mary's, in Lincolnshire. In the smaller spires, where the transition from the square to the octagon almost always occurs, some very picturesque effects are produced in a very simple manner by the use of the broach spire, or by a simple flanching off, as commonly seen in our village churches. In the Byzantine works, the square base scarcely appears at all. In Armenia we have some approach to the Gothic form, as in the case of the tambour to the dome of Ani Cathedral. The Saracens began apparently by placing a circular dome directly on the square, as seen in the Cuba, and in many of the churches erected by their architects after the Norman conquest; and as they still do in the erection of their tombs. This, however, was a very rude way, so far as the external effect went, and they soon began to improve, going to work in a very Gothic-like spirit. They first flanched off the angles of the square base, until they had resolved the latter into the octagon form, whence to the round of the drum of the cupola was an easy transition.

The same method was used in the bases of many of the minarets, as at those of mosques Hassan and Kaid Bey, at Cairo, and though very simple, was entirely successful, and produced the most graceful transitions of outline, and contrasts of light and shade: it is, in fact, precisely the same way as used in our little village spires, or in the towers where the change of form occurs, as in Uffingdon, for instance. At the base of the drum the above method produced a series of square-headed gables, and these the Arabs filled in with the Gothic-like semi-traceried windows I have already described.

There are examples of this in nearly every mosque and tomb of consequence in Cairo, and the simpler forms are more especially to be seen in those of the Emir Akhour, the Mahmoudieh, Barkauk, &c. Soon, however, it was found that this arrangement, however picturesque, gave somewhat too large a surface of plain masonry, and so the architects cut the flanched surface into a series of very bold mouldings, and enriched the plain gable with trefoil and other enrichments, an excellent example of which may be seen in the mosque Kaid Bey. This arrangement gave perhaps as much richness to the upper part as was required to lead the plainness of the lower part into the extreme richness with which the whole surface of the dome was in later times decorated. I may particularly allude to the beautiful domes at Cairo of the mosques Kaid Bey, Akhour, and Ibrahim Aga.

I have now alluded to the chief peculiarities of the style in the earlier works of Egypt and Spain. I have purposely omitted Constantinople, for it was not conquered by the Mahomedans until 1453 (about the time of the mosque Kaid Bey), when the style had reached, perhaps, its culminating point. They did not then destroy the churches of the Christians; but they whitewashed the mosaics, altered the details, and arranged the buildings for their own forms of worship; so that the mosques and palaces of Constantinople show, not the pure Arab style, but a series of works of another nation, altered for their own requirements,—not for any love or reverence for those works, nor because they were exactly suitable to their own wants, but because it was easier to alter than to replace them. India likewise has quite a separate existence in art history. It was not conquered until the end of the tenth century, and then not by the Arabs, but by Turks and others, who borrowed largely from Hindoo sources. The whole subject has been so deeply investigated by Mr. Fergusson, that I should fear, in touching upon it, I was almost invading his province. The real Arab architecture is that which I have described in Syria, Egypt, and Spain, the latter being not perhaps so pure as the rest, and containing many traces of the previous Christian architecture of the Spaniards.

Sicily was conquered in the ninth century. In it several very good and pure examples exist; and at Palermo especially, there are very curious and well-known cases of Arab architects having, by a sort of retributive justice, been compelled to erect Christian palaces and temples. Taking now a general view of the Arab style, we find it characterized by great beauty of detail, and exquisite appreciation of colour, but wanting in the power and vigour which mark the architecture of other races. The detail is in the highest degree conventional.

Every ornament, every pattern (and none are there more intricate than those of their mosaics and stonework), seems the result of the deepest thought, yet the wildest fancy, restrained by the severest of rules. But, except in India, where such masses as those of the great mosque of Delhi attest the boldness of the designers there, we see little trace of the powerful minds which could raise high in the air the great dome of St. Peter's or St. Paul's; or send towering up towards heaven, the grand outlines of Canterbury or Lincoln. And even in their graceful ornamentation (and it *is* so graceful, so wildly luxuriant, yet so restrained, that we can hardly venture to carp at it), one great element of beauty is everywhere absent—nature. That law of their prophet, that the Creator's works were not for man to copy, shut out for ever from his followers this one chief source of beauty; and, save in a few instances, at Damascus and in Spain, there exists, in all the Arab works, no copy of created thing, living or inanimate. Deprived of such an aid as nature, their works speak to the eye only, not to the heart. The Arab architect dare decorate his work with no likeness of those whom his nation revered or loved. No cunning workman, as he carved the stone in Egypt or in Spain, dare grave upon it the flower or the leaf, or the animated form which might remind him of his native land; and thus to him, if I might dare to paraphrase the words of our great poet, was " Beauty by one entrance quite shut out." Yet, let us do him justice, and admit that, with what light he had, and in his own chosen style, he worked with a grace and beauty never, perhaps, surpassed.

Considering now in a general view the perishing works of this decaying race, let us ask ourselves this important question.

Is their study to be a mere pastime, a pleasing subject for the mind or eye, or may we make it of some real value, some actual use? We may use the style itself, but altering its details to suit our habits. I plead guilty to the charge myself of having done so once, but it is a course which I neither advocate nor defend. Or, practising in one school of art, we may step beyond it, to introduce within its limits the beauties of another, and thus fill up some gap, or strengthen some weak part, which study or experience points to in our own:—a most seductive practice, but a very dangerous one, and there are few who could carry it out successfully, as your chairman, for instance, has done; nor should I have ventured to make the few remarks that I am about to do (although the subject is one upon which I have given some thought, viz. the application of the forms of the dome to Pointed architecture), had I not been fortified by the authority of others whose right to give an opinion no one will dispute. Some two years since, after a lecture of mine, at the Royal Institute, Mr. G. Scott expressed his opinion distinctly, that there was no reason, beyond certain difficulties to which he alluded in the working out, why this form should not be used in the Pointed style; and I had the pleasure of hearing Mr. Street, only last week from this place, repeat the same opinion more at length. Now this would open to us an entirely new field of design; for, beyond those in France, and a few examples (Pisa, for instance) in Italy, there are, to my knowledge, none whatever existing. Where, then, are we to seek for objects to study—Not copy? The French remains, though picturesque enough within, give little aid to us in their external forms: we may go the Rhenish churches, whose outlines are picturesque enough, and often have combined with them the tower or the spire. But I must leave the examination of their merits to others, and direct your attention to the examples now before us from Cairo. Though utterly different from the Gothic, they seem to me to be, with the exception of that of mosque Hassan, worked out altogether in the true Gothic feeling.

They are all, or nearly all, combined with the outline of the towering minaret, which itself springs almost invariably from the ground, as do the Gothic spires, and those of Sir C. Wren, instead of their being stuck astride on the roof as are those of later date.

There occur in the design scarcely more of the strongly marked horizontal lines which characterize Italian work than we find in the corbel tables of our spires or towers; and the whole effect of the minaret and dome, when closely placed together, is that of a composition of vertical lines increasing in richness to the summit. I am not now speaking of such long façades as those of mosques Hassan and El Moyed.

There you get the horizontal line strongly marked; but I refer to such beautiful works as those of Ibrahim Aga and Akhour, and to some of the tombs even when quite isolated and without the minaret. I know that I am treading upon dangerous ground, but I hold that the way of bringing out the circle of the dome from its square base is essentially Gothic in its bold, plain way of showing the transition, and converting into a beauty that which in other styles was put aside as a deformity. Not that the Goths would not have improved upon the form.

I doubt—I almost doubt, in spite of my reverence for the architects of Lincoln and Canterbury, whether they could have much improved some of those minarets.

But how they would have filled up those great gables of the domes! What magnificent rose windows may we picture to ourselves there, and the spandrils would have been filled with the beautiful scroll work that we know so well; and how from the nucleus we should have seen pinnacle and canopy arise, breaking, but adding beauty to the outline.

But though there might not be one feature which the Gothic architect would not improve—though there might not be a detail which, by the marvellous power of his fancy, he could not light up and vivify with beauty—I hold that the form which the old Arab gave to his minaret and dome would harmonize well with the added work of his Christian enemy; that scarce one line which the follower of the Prophet had marked out need be changed by the Goth to work on; and that he, in stamping upon these old monuments the character of his own glorious art, might almost forget that the stranger reared them, and see in them almost the creation, in another age, of his own race. This has been but an imperfect sketch. The rise and progress of art in a people who for centuries kept the world in fear, and whose religion, excepting only in Spain and Greece, still, even now, holds its sway upon the minds of all the nations whom they conquered, can scarcely be well told in the compass of an hour. The glory of their race is gone; its works are in decay; art and science still owe to it a debt of gratitude.

The Arab monuments press lightly, indeed, upon the soil which bears the ponderous masses of the Roman and Egyptian; but they possess in grace and beauty what they want in power. They are to the mere copyist (to him all things are so) useless. But to other minds they offer themes for study and wide scope for thought; and if from the perishing works of these old Arabs can be snatched some trait of beauty, or be transplanted into other lands some form of grace unknown to them before, those who have preserved these decaying works, by the imperishable power of the pen or pencil, will have earned no little claim to gratitude from all the devotees of art.

CAIRO.

Read by Mr. T. Hayter Lewis, at the Architectural Photographic Society, on Tuesday, February 22nd, 1859.

I COULD have wished that you could have had the advantage of hearing Sir Gardner Wilkinson, or my friend Mr. Owen Jones, both of whom I had suggested as so much better qualified than I am, to do justice to the subject; but, as circumstances have prevented this, I have, at the request of the committee, accepted the task, and, quite aware of my own deficiencies, must ask for your kind indulgence in its fulfilment. As Cairo is not so well known as Rome or Venice, the subjects of the two former lectures, I shall give a slight sketch of its history and its principal features, and then describe it more in detail, by the help of the photographs, and of some beautiful sketches lent to me by Mr. Owen Jones. The exact date of Cairo is well known, as it was founded shortly after the invasion of Egypt by the Arabs, and so far as I am aware, no other city had occupied its site. There are few great towns of which the same can be said.

Search, for instance, here in London, and some 15 feet below its present streets, buried under the *débris* of centuries, you will find the mosaics, the walls, and baths of Londinium of the Romans; and deeper still even beyond that, tradition points to the buried city of the people whom they conquered. But, in Cairo, you will find only the rich virgin soil, which the Nile, for thousands of years, has been laying down over the barren sands, and changing by its fertilizing flow, the arid desert into a smiling garden. Yet if it can boast of no antiquity, its neighbours were some of the most ancient in the world.

Within a few leagues to the south lay Memphis, the great capital of the Pharaohs, after the glory of Thebes had declined. Some two leagues to the north lay Heliopolis, where Herodotus and Plato were taught the learning of the Egyptians: within sight are the everlasting Pyramids and the Sphynx; and within three miles was Babylon of the Nile, afterwards a great fortress of the Romans, and now, like Memphis and Heliopolis, scarcely recognized by a few ruins.

Nearly on the site of this Babylon, El Fostat, or old Cairo, was founded in 639, by Amrou, general of the Caliph Omar, who built there the mosque of Amrou, now ruined like the town itself. But in 970 Gohir, another Arab general, founded at the foot of the Mocattam mountains, between them and the Nile, Cairo the Victorious, which a few years after became the residence of the caliphs, and the capital, in place of Fostat. In 1171 the French crusaders advanced into Egypt, and the Sultan, anticipating the Russian plan in their late wars, set fire to Fostat, to prevent its falling into the enemies' hands. It burnt for fifty-four days, and most of the wretched inhabitants, when the French retreated, abandoned the old town, and took refuge in the new one, which at about that time was largely increased by the celebrated Saladin, who, as I shall presently show, enlarged the city to nearly double its former size, and gave to it some of its now leading features. I may add, that in 1754, the town was severely injured by an earthquake; and that in 1798, during the French invasion, it suffered the usual calamities of a besieged town in consequence of an insurrection of the populace.

It now occupies an irregular site of about three miles long and two broad, or about seven square miles, some slight distance back from the Nile, and according to the various times of the year, and the heights of that river, lies in the midst of a luxuriantly fertile country, an expansive lake, or a rank marsh.

Like most towns in a decaying empire, where life and property are insecure, it is compressed within walls which, in its prosperity, enclosed 300,000 citizens, but now, in its decay, some 100,000 less. Internally it is divided into no less than fifty-four quarters, each separated from the other by a wall and gates, and is a vast mass of narrow streets and wretched alleys, with houses overhanging, so as almost to exclude the light of day; studded with vast mosques and palaces, whose crumbling walls and domes speak of the glories of the past, and with the decaying tombs of their founders, from the hands of whose descendants the sceptre has departed.

Amongst the photographs there are six views of the city, taken from the Arab mountain; Moccatam, from the north of the citadel; Old Cairo; citadel; and the panoromic view taken also from the citadel. Now, looking at these beautiful views with the eye of an architect or an artist, we find almost every requisite for the picturesque and the grand but one, viz. some grand central mass to which the forest of minarets and domes might be subordinate,—something to form the culminating point of all the beauty, and to tower above it as St. Peter's does above the Roman palaces, and as the great church of the Fiori does above the campaniles at Florence; or as St. Paul's, as superior, perhaps, to these in grouping, as it clearly is in outline, does above the innumerable spires of the city churches of *our* city, which we value little, because near to us, but which, as seen from the eastern bridges, and contrasted with the grand massing of Barry's towers at Westminster, present an architectural group never to my mind exceeded. It is true that in Cairo we have, in the Mosque Hassan, predominant in every view, a structure of imposing size; but even its mass, compared with those I have mentioned, is poor, whilst it has the disadvantage of possessing two minarets of unequal form and height, and perhaps the really only ugly dome in the city. But put this want aside, take Cairo as it is, with its graceful minarets, its sculptured domes, its houses of many colours, here spread with drapery and there shaded by the graceful palm, abstract from your mind the ruin and decay (never more active than in an Eastern city), people its great squares with the gay Egyptians, let the bright Eastern sun flash on the waters of the Nile, show in the far distance the hoary Pyramids, and light up with rays of gold the minarets and domes, and in this glorious picture you will but have realized fair Cairo as it was,—a vision almost of dreamland. Enter within its walls, and its filthy alleys, its mud-built hovels, its ruined mosques, your dream is gone. From the contracted nature of the streets, it happens that the leading thoroughfares cannot be distinguished in the photographs, and to make the subject more intelligible, I will occupy a few minutes in describing them before going into the detailed examination. The main street leads from the citadel through the gate of Zouayleh by the bazaars of the Kaleel and Ghoree, by the great mosques of El Moyed, Ghoree, and Kaloun, to the northern gate next the Desert. Nearly parallel to it, but farther west, is the old canal, a pestilential marsh when the Nile recedes, and by the side of which poor Burckhardt, the bold traveller, lived and died. He is buried in the cemetery, just outside of the northern gate. This canal was once thought to be that cut by Trajan or Adrian; but it has since been attributed to Amrou, and Sir G. Wilkinson, I believe, considers it to have been the work of Ramses II. (Sesostris) re-opened under the caliphs. Quite to the west, nearer the Nile, lies the great place of Ezbekeeh, near the Alexandrian gate, bounding the Frank and Copt quarters, and between the main street and the canal, no great way from Mosque Hassan, is the large open space of the Birket el Fyl, which, in the time of the inundation, is a large lake surrounded by pleasure-houses, overhung by trees, and covered with pleasure-boats. The other large Place, the Roumalee, is seen close in the foreground, in front of El Hassan. I must mention here that I have purposely exaggerated in the map the width of the streets, the chief of which only are shown, in order that they may be better seen here. Beginning, now, with the immediate foreground of the panorama, we have the long low line of flat plastered roofs belonging to the outbuildings of the lower part of the citadel, and in them you will see numerous projections like dormer windows, formed of boards, in the most temporary manner, and all pointing to the north or north-west, for these are to catch the cool winds which blow from that quarter, and to entice them into the sultry interiors below. In the centre of the picture, under the great mosque, is a low, dark archway, leading from a narrow road, which, hemmed in on each side with high walls, has run deep with blood almost in our day, for it was close here, in this same road, that the Mamelukes were massacred by Mehemet Ali. The way leads down to the great Place of Roumalee, into which it opens by the gate El Azhab, or the citadel. Directly to the left of the gate is the minaret, fast decaying, of the old mosque of the citadel; directly in front is the great mosque Hassan, shown in nearly every view. A little under is the pretty little one of the Mahmoudieh; still farther to the right is that of the Emir Akhour; still farther to the right, down the street, that of Ibrahim Aga; and, in the distance, the last mosque, perhaps, clearly distinguishable to you, is the El Moyed, with its two great minarets flanking the gateway of Zouayleh.

To the left of the Hassan are the Sheyk Houn and the Teyloun, and still farther is the long low line of the aqueduct, which, stretching from the citadel to the Nile at Old Cairo, almost bounds the view. The whole of this great mass of houses and mosques was, before the time of Saladin, merely a suburb of the town itself; for, until he enclosed it, and built the citadel (about 1180), the city ended with the gateway next El Moyed and the mosque Teyloun was the only one of note between it and Fostat. As, in every view of the town, we meet with the mosques as the chief features, I have thought it better to explain, in a general way, their internal arrangement, which cannot be seen by the photographs, and must ask you to follow me through the details of these two places, viz. mosques Amrou and Hassan, the former dating from a very early time, and the latter from the fourteenth century, which may serve as fair specimens of the whole. You will see that the arrangement in each (in fact, all, or nearly all, in Cairo) is that of a great open court, containing a large water-tank, or raised reservoir or fountain, surrounded on all sides by colonnades, as in the mosques Amrou, Teyloun, Hakem, and El Moyed; or of great arched recesses, answering the same purpose, as in mosques Hassan and Ghoree, and having completely the cruciform plan. The side nearest to Mecca (here the eastern) is of greater width than the others, and, is, in fact, the only part reputed holy.

In the wall bounding the east side are niches for prayers, to mark the direction of Mecca. To the right of the central one is the mimber or pulpit: opposite are the reading desks, where the copies of the Koran are placed, and a tribune, supported on little columns, whence the Imaun announces the hour of prayer and chants the choral services. The very beautiful drawing of the interior of El Hassan gives a very excellent idea of the general effect.

The columns and capitals in the earlier mosques were taken without scruple from the ancient buildings in the neighbourhood; but, as the Saracens abandoned themselves to the arts of peace and luxury, they rapidly formed a style of their own, and developed the very beautiful one which we know so well. The most graceful ornamentation was lavished on the various parts of their mosques, and the pulpits, the lamps, the fountains, are studies of beauty of form and detail.

The lighting was often effected by an immense number of single pendant lamps, combined with chandeliers of great size and singular design.

The Mussulman puts off his shoes on entering the mosque, washes his hands, face, arms, and feet at the central basin or fountain, and enters the eastern part of the mosque at the hour of prayers, their holy day being Friday. He prays turning towards one of the niches, and hears a priest read a portion of the Koran from the reading-chair. Prayers are chanted by one or more priests from the platform.

and the Imaun ascends the pulpit, and preaches thence. In Mr. Lane's work there is the translation of one of these sermons, and by no means a bad one. The internal walls are usually whitewashed, but the voussoirs of the arches are often formed in differently coloured stones, the ceilings elegantly domed or beautifully carved in wood. Sometimes the arcades are of brick, plastered, as in the earlier parts of El Azhar and in Teyloun.

Externally, the stonework is almost always in alternate rows of black or red and white; the black being of basalt, the white of the country limestone, and the red tinge given by red ochre. Mr. Owen Jones's drawings give an excellent idea of these arrangements.

These domes are sometimes of brick, plastered, or of wood only, plastered, as El Hassan; but often of stone, as in Kaid Bey. The plans of the mosques vary as the plans of our churches do; but the general arrangements of the fountains, niches, and pulpits are always the same. The minarets seem to have been placed in any situation that might be considered best for the purpose, and to prevent the hareems being overlooked by the Muezzins as they called the people to prayers, these criers are usually chosen from amongst the blind, no lack of whom exist in this ophthalmic town. The domes which, with the minarets, give the chief character to the city, are not, as we should suppose, in general over the mosques themselves, but form the canopies of the tombs annexed to them, to the small space over the niche, or to the fountains in the centre. In the mosques Teyloun and Amrou there is no tomb, and therefore no dome, except as I have described. In those of Hassan, El Moyed, Barkauk, and Kaid Bey, the domes are large, but are raised over the tombs of their founders or descendants.

The number of the mosques is quite extraordinary, it being stated to be no less than 400.

To show the case strongly, let us take one of our own great cities, Manchester, with 430,000 dwellers in it, or half as much again as Cairo had in its glory, and to this great number there are at the utmost 200 places of worship belonging to all denominations together—not one-half of those in this smaller town. And these said mosques are not in general small, poor buildings: on the contrary, some are of gigantic size, and the one before us (Hassan) could, in one of its great niches, hold the whole nave and aisles of Oxford Cathedral, with plenty of room to spare. It will, within a trifle, take under its great arch the famed Luxor monument, pedestal and all, at Paris; you must add 50 feet to the height of our Monument before you get to the elevation of one of its minarets; and you might, upon its surface, lay Cologne Cathedral, commenced eighty years before it.

I would not, indeed, place this plain, massive building to compare with the delicately elaborate work of Cologne; but these grand mosques contain much more than the temple of prayer, and are often much more elaborate buildings than might be thought. Each generally contains a public bath, school and fountain, and that of Kaloun, for instance, contains the well-known Moristan, or hospital for lunatics, and the large spaces in the angles of El Hassan are filled with apartments for the priests, and with other buildings, no less than nine stories high.

And remember that Cologne is not finished yet, whilst Hassan, begun eighty years after it, was built in three years. Think of its great mass, its dome, its minarets higher than our Monument, and then give only three years for its erection. These old Caireens were no bad builders.

We have in the photographs the following shown:—Mosque Habenia (or Ibrahim Aga); Omar, near Mocattam; Ayeb Bey (or Kaid Bey); of the Citadel (a modern work); Mahmoudie; Kaid Bey; Emir Yan; besides the great mosque Hassan, already described, and the great ones of Amrou, Teyloun, El Moyed, and Kaloun, which are to be seen only in the distance. Of these, the earliest in date is Amrou, built at Fostat in 642, but very much altered since: next to that is Teyloun, remarkable for the outside winding staircase to its minaret, and for the beautifully-pierced stonework in its windows; El Azhar, 981, but with a beautiful minaret added in the sixteenth century, and then numbers of others, up to the end of the mosque-building age, in the beginning of the sixteenth century, when the great mosque, El Ghoree, was built. One there is indeed erected since, that of the citadel, by Mahomet Ali; but its barbarous style and ornamentation make it unworthy to rank with its predecessors.

Next to the mosques come the private houses of the town. Their chief external feature is the projecting window, formed of wood, carved in the most elaborate patterns, and with the smallest quantity of light through it, for these upper rooms are the residences of the ladies, and as the narrow streets almost make the overhanging houses meet at the top, the greatest precautions are taken to prevent the invasion of the privacy required. The wood is usually fir, and left unpainted. In the chief streets the lower parts are used as shops, the rooms over not communicating with them, and separately occupied in the way in which we are familiar in most of the continental cities; but where the lower story forms part of the house, the front, up to the one-pair, is commonly of stone, in alternate stripes of red and white, as I have described for the mosques. The upper stories, of which there are often two or three, overhang considerably, as you may see, or rather may have seen them, for they are disappearing fast, in Chancery Lane and other old parts in London, and in most old timber buildings here and abroad; but we miss the bold gable which gives so picturesque and noble an effect to our old places; and when ornament does appear, it seems put in for concealment or defence, much as we use shutters and gratings; and if the Caireen defences be ornamental when ours are not, it is simply, I think, because there is in the Oriental mind a tradition (if I may call it so) of beauty, which pervades all classes, and will make a common workman shape his work in forms of elegance which we vainly seek for here. Whether this be the offspring of a real perception of the beautiful, or whether it be, as I have called it, a mere tradition, a mere rendering unchangeably of common things in a graceful way, because no other way was known to him, would be too deep a subject to enter upon here. I believe in the stereotype and the tradition. But be it as it may, the Caireen houses, even of the largest class, have little external grandeur, though some perhaps may lay claim to it; as, for instance, the palace of Achmet Pasha, shown in the photographs, near to the mosque Hassan; and where, as you will see in numberless cases, the projecting windows are wanting, the fronts present as bald and lifeless an appearance as the rows of two windows, iron railings, and a door, in Harley Street, and others of that time. These windows, causing great risk in case of fire, are not, I believe, to be allowed in future houses. The entrance-door is usually so contrived, that when you open it, the passer-by cannot look into the house, and, in fact, you may consider that the architect in planning it has, as one of his chief objects, to provide every possible means of concealing every thing and every body,—his rooms, his money, his wife, and very often himself, and to give him a way of escaping for his life by some back way. Whether or no from this idea, the houses are arranged in the most irregular manner, no one part answering to another, no two parts of the same story, of the same height, and the whole filled, in the most break-neck way, with steps to and from the unequally levelled rooms. To give a notion of the plan ("where plan is none"), you may assume that, passing through the jealous barrier, you will find an open court shaded from the sun by overhanging eaves or drapery, and into this court open the doors leading to the various rooms and stairs. At the back is a large garden surrounded by high, jealous walls, and in the upper stories the harem. I can't enter there. One circumstance seems at first curious. There are no bed-rooms—not that people do not sleep in the East; they have been sleeping for centuries, whilst we Northerns have been pushing them out of their seats; but the fact is, that the beds are merely mattresses, rolled up in the day, so that the room is a sitting-room under the sun, and a bed-room with the stars. The furniture would horrify Gillow or Banting, for the best rooms have usually a carpet, a divan, perhaps some curtains, and a few trifling articles of ornament or domestic use. The windows now have, in many cases, casement sashes and glass,—a modern innovation; but they often have a filling in of gypsum in thin sheets, gorgeously coloured. The ceilings, too, in their best houses are of very elaborate designs, the mouldings gilt, and the ground covered in the most glowing tints. The roofs, as you will see in all the views, are flat, covered with plaster. The shops are not quite of the size and splendour of Howell and James's, nor are the bazaars quite so grand as those of the Pantheon, nor of our friend, Mr. Owen Jones's, opposite to it; for the shops are generally about 6 feet square, closed at night by shutters, which by day form counter, chair, and shelf; and the bazaars are simply so many shops put together, containing the same sort of goods, the open way between being covered in with awnings to exclude the sun. Few streets are broad enough for carriages, and they are laid with soft sand, not very pleasant when the wind is high and the traffic great, and which causes wary walking, to prevent some huge camel or some great donkey, with his noiseless tread, crushing you against the sides.

The houses of the poor are built of mud, situate in filthy alleys, and, no doubt, the first idea in going into one would be, that the sooner you got out of it the better. The next things to be noticed are the fountains. We have some in London. There are two in Trafalgar-square, and somewhere in the Kent-road, ever since I have known London, a sturdy Triton (I am afraid he is a plaster one) has been spouting a very little water from a very large shell. I dare say he is at it now. I hope he is; for even as he is, we cannot afford to lose him. There is, too, in the Temple a pretty little one; that is, the water and trees are pretty, for there is nothing else, and it is a nice change from the hurry of the streets, or the pleasant odour of the lawyer's office, to hear that pretty trickling. They have fountains, too, in Cairo, and they make them there grand things, as you may see in the photographs; all ornaments to the town, to which they give that blessed gift—water. And with an idea truly poetical, if it be not, as I am afraid it is, accidental, these buildings are fountains of refreshment to the mind also; for they have, in general, over them, an extensive building, used as a school for the district, and thus making, altogether, a very imposing mass.

These fountains are, however, on too large a scale for our use, being, more properly speaking, great public store cisterns. But the smaller kind, as seen in some of the mosques and in the private houses, are worth study. The basins are usually level with the ground; the outline being, perhaps, an octagon with curved sides, or other quaint pattern, with a rich border of mosaic. The designs of the upper parts was very Mediæval in its treatment, allegorical figures being seldom introduced even to the extent seen in the Court of the Lions, at the Alhambra. The effect being produced, usually, by a few columns and marble basins, arranged in regular and somewhat quaint forms.

To put the Caireen fountains, however, fairly with our own, we certainly must remember that they represent the whole water-power of the city (as they do in most cities of the Continent), except the acqueduct,—and that, truly an Oriental notion, serves only for the citadel.

Very grateful ought we to be for these photographs, and for such works as those of Owen Jones, Roberts, and Coste, in preserving to us the exact likeness of these buildings, whose decay is daily enhancing the value of these copies. And in the midst of a fanatical populace, a sketch or a photograph is a work of much trouble and some danger.

I hope that in the new movement which we may, I think, now call successful, the fountains in our streets may be made as ornamental to them, as they will be useful to our citizens.

We now come to the tombs. On each side of the hill of the citadel there lies the city of the dead, the great necropolis of the living town; and missing, as we must, the gracefully sombre foliage of the Turkish burial-grounds, still under the shadow of the barren hills, removed from the turmoil of the town, the place is as well chosen as it might be. This, too, is all ruin. Very beautiful, and of great size, are the chief tombs; and to each of them there is a small mosque attached, so that each tomb rests in a house of prayer. Very Gothic were these Saracens in their death memorials. To their memories were carved no winged victories, no fearful spectres; no long inscriptions showed the grandeur of their virtues; but each old soldier of the Crescent (his Cross) lies in his stony grave, and above him rises the lofty dome, and the long inscription, not to his glory, but his Maker's, the idea to the very letter of our Gothic effigies and tombs in their memorial chapels. The old "Cujus animam propitietur Deus" in place of the long list of our modern virtues. Still more close is the resemblance shown in one of the tombs which brings to our mind the beautiful canopied ones of the Middle Ages. Next comes the citadel, from which several of the views are taken, but of which we have, I think, no direct view. It was built by Saladin when he enlarged the town, and, except the new mosque, of wretched design, rebuilt by Mehemet Ali, of which I have before spoken, and which in its building involved the destruction of the really fine old hall of Saladin, there is nothing worthy of detaining you. From it leads the acqueduct, which, originally built on wooden pillars by Saladin, was reconstructed, in 1581, as it now appears. It leads direct from the Nile at a point where you see a large, massive, low tower, and where the waters of the river are raised by means of oxen to the requisite height. These Saracens were famous water engineers, and many a town they founded or conquered still owes thanks to them on that head.

There is a famous work, still almost perfect, at Palermo where the water is brought down from Mount Pellegrino, and its force checked by a series of towers, which, overgrown by a luxurious foliage and dripping with a constant stream, have a most picturesque effect. Now we come to the Nile. It is not an architectural work, but, if we may trust the father of history (and the more we know the more I believe we find we may trust him), it is an engineering one, though tolerably ancient; for Herodotus says distinctly that the river in old times used to flow to the East of Memphis, but that a new channel was formed for it, and that the Nile, as we now see here, left its old bed (still visible in the Desert), and flowed as it does now. Be that as it may, it now brings fertility to this valley, and did so for thousands of years before Cairo was reared upon its banks.

At the south end of the island of Rhoda, which stretches almost from old Cairo to Boulak, is the Nilometer, a column graduated to register the rise of the river, formerly at Memphis, but removed thence to this site in 847 by the Saracens. There is no view of it, I believe, here, and a sketch of it was, until lately at least, a work of some danger. Mr. Roberts got one, but at the risk of his life; and it seems from the drawing to be a plain fluted column, without a capital, its lower part in the water, and surrounded by a ruined Arab building.

The actual rise of the Nile, which inundates so vast a surface of country, is much less than one would perhaps guess, being only about half as much again as the height to which the tide rises twice a day at London-bridge. The rise begins in May, and is full at about Michaelmas. I have dwelt upon this part because the site of the Nilometer is one whose traditions are of intense interest, for they assign it as the place where, 3,430 years back the infant law-giver of the Hebrews was exposed on the banks of the river and found by the daughter of Pharaoh; and, so far as I am aware, there is nothing to make us really disbelieve that it was so. I fully think that the undoubted scepticism on such points that does arise in the traveller's mind is not the offspring of any innate want of faith, but of the exaggerated tales and the wretched legends which, false as we know them to be, spread a doubt on the whole, and the truth is that we doubt against our own convictions. Most of us, perhaps, have, for instance, seen the Tarpeian Rock at Rome. We go there ready to believe, to accept almost anything as its representative; and how are we met? By a lot of ragged children, and "Tarpeian Rock, sir? show it you for a halfpenny." Our first impulse is to kick the nearest boy over the rock, and run away from it as fast as we can.

We pass down the Nile by the beautiful island of Rhoda, studded with pleasure-gardens, to Embabeh, a wretched little village, but known as the key of the position held by the Mamelukes in the celebrated battle of the Pyramids, where Napoleon destroyed their splendid cavalry; and no great distance off is Dæckki, where some few years after our red-coats encamped. Nearer to the town is Boulak, the port of Cairo, and built on ground which, when Saladin enclosed the town, was part of the bed of the Nile. It possesses a very fine mosque, with a beautiful minaret of the fourteenth century; but the town was in great part destroyed during the invasion of the French. There is a branch hence to the railway station, near the Alexandrian Gate, whence to the east goes on the rail to Suez. Going eastward, we come to the gates of Conquest and Victory—the pilgrims' route to Mecca. There is no photograph of these, but the former is strikingly like the gate of the citadel. This completes the circle of the town In taking, now, a general retrospective glance at the various buildings, the mosques, fountains, tombs, and houses, that I have spoken of, the first thing to be considered is, I think, their great comparative age. They are so new, contrasted with the hoary monuments around them; the whole city so clearly defined in date, that in the neighbourhood of Memphis and the Pyramids, we forget how much beyond anything we have is the age of these works. The mosque Teyloun, with its pointed arches, minarets, dome, and beautiful details, was finished, very much as it is seen now, in the latter part of the ninth century; El Azhar was in the tenth century; and the beautiful mosque tomb of Sultan Barkauk, in which the style seems to have been perfected, was finished by the middle of the twelfth century. To the first of these dates not a single building in England, so far as I am aware, can be clearly assigned; but in Italy, S. Vitale, at Ravenna, S. Clemente and the basilicas at Rome, had been raised, and so, also, had many of the campaniles. Germany could boast of none of its great Churches. At the date of the Mosque Barkauk, we had parts of Durham, Peterborough, Norwich, and St. Cross erected in the round arched style; In Italy, the cathedrals of Ferrara, Pisa, Modena, and Venice; and in Sicily, the very beautiful buildings at Palermo, Cefalu, and other places. In Germany, the great Rhenish churches were far advanced. It was not, however, till the time of the tomb of Kaid Bey, in 1465, or even perhaps that of the Sultan El Ghoree, in the beginning of the sixteenth century, that the style may be said to have arrived at its culminating point, and by that time our own architecture had passed through all its phases; from the heavy Norman to the bold towers of Canterbury and Magdalen, the rich tracery of Henry VII.'s Chapel at Westminster, and the roof of King's College, Cambridge. The architecture of the Continent, too, had progressed as ours had, and at this time Belgium had erected her fine halls. France had long since completed her great cathedrals, and in Italy, San Spirito at Florence, and the Certosa at Pavia, showed her leaning to the Renaissance.

For this long range, from the Saxon towers to those of Magdalen and Canterbury, and from the Mosque Teyloun to that of Ghoree—that is, from the ninth to the sixteenth centuries, we may naturally expect to find an entire change in the architecture of Cairo.

I have purposely excluded from the review anything beyond the general features of the Mosque Amrou, as it has so often been rebuilt that its exact age is doubtful. Were that to be admitted in the comparison, we should be carried back to the seventh century, the times of our Benedict Biscop of Landisfarne and Jarrow.

To begin with the plans: that which I have drawn of Amrou may represent also, in its general features, Teyloun of the ninth century, and El Azhar and El Hakem of the tenth and eleventh. We find it again in El Moyed, of the fifteenth century; but this is an exception in these of later times. For the great mosques of the twelfth century and after, adopted, in general, the cross form of four great arches or recesses leading out from the four sides of a court, still open, but very contracted, compared with the former extent; till in the later ones, as at Kaid Bey, we find the centre itself covered. The temptation seems almost irresistible, in looking over these places, to cover the great centre square with a vast dome; but in the few instances of this space being enclosed, it is so with a flat ceiling and a lantern-light, the dome on a grand scale being almost always reserved for the tombs. The domes themselves come next in review; and I may, perhaps, be forgiven, if I detain you a few moments on a subject which has been with me a favourite study. We must remember that before these of Cairo were built, the only domes that we know, such as S. Sophia, S. Vitale, and those of that class, were formed for internal effect alone; or, if the effect of the exterior were studied at all, the attempt to make the dome form a graceful crown to the composition was decidedly unsuccessful. But here, from the first, the whole result, whether seen from within or without, was singularly well studied and successful; they are brought up from the square form into the polygonal, and the centre into the round, in the most graceful manner. In the very earliest specimen, the fountain of Teyloun, the dome, although perfectly plain, and more abrupt in its transition from the square than the later ones, shows the germ of the finished style, whilst, with almost the single exception of El Hassan, the rest attain to an elegance not, I think, to be surpassed. At first the exteriors were plain, as we are used to see them; but latterly they were covered with diapered ornaments of great beauty, as you may see in the mosques of the Emir Akhour, Kaid Bey, and many others. Whether this cutting up the surface, however beautifully, would answer on a grand scale, may be matter of great doubt; but there can be none as to the way in which the internal work was done. In Cairo unlike Sicily, Persia, and other places, this was, I think, invariably by means of the well known honeycomb ornament, by which, by insensible gradations, the circle was worked out of the square You may see a very beautiful specimen of it in the Alhambra Court of the Crystal Palace, and the next time you look at it, oblige me by thinking how you would begin if you had to copy it, for of all ornaments I ever sketched, this is the most puzzling. Gothic tracery is sometimes troublesome enough when the exact curve eludes one's eye; but this is ten times worse, and no one who has not tried it can imagine what it is. I thought the mosaic ceiling of St. Marc's sacristy was tolerably difficult, but when I tried my hand at the honeycomb, everything else seemed easy in comparison. The interiors of the domes themselves are ornamented in a conventional manner,—in a manner which I can scarcely describe,—being covered with ornamental work disposed in rings, and not in any way breaking up the outline of the surface. In the minarets we find the same difference as in the domes. The earlier were very plain, and, as Lieut. Burton describes them, were "plain round or polygonal towers, without stage or balconies," somewhat as may be seen in the old mosque of the citadel in front of El Hassan in the Panorama. These gradually altered in outline and increased in richness until they became the beautifully ornamented towers that we know so well. I know no finer study of form than these graceful towering structures offer in contrast with the massive wall or the swelling dome, and it is from these outlines that we may, I think, learn much.

In all the Renaissance of Italy I cannot call to mind a single instance in which the Gothic outline of the spire has been boldly put in contrast with the massive dome; and of all the great architects of that time, Wren, alone, I think, has used it in an Italian form. What it became in his hands our City churches show.

The other great characteristic of these buildings is shown in the side of El Hassan. I mean the gigantic porches to the entrances. They range commonly from the bottom to the very top of the façade, which is often raised at that part to give even greater height; and they are worked out from the square into the semi-dome, and often into a sort of trefoiled arch in the most exquisite manner. But however grand these entrances might be, the Arabs were too good artists to spoil by their enormous size the effect of the interiors, and they thus allow them to remain mere porches, the doorways from them into the mosques being of ordinary dimensions only.

The arrangement of the private houses is necessarily so totally different from that of our own, that the study of them would appear likely to lead to slight practical result. Now, however, that large surfaces can be so easily covered with glazed roofs as to give all the effect of open spaces, it may be worth considering whether, in our large country-houses, where the space to be covered is not an object, the centre court of these Caireen houses may not be studied with advantage.

It differs from the otherwise somewhat similar plan of the Pompeian, in having a number of stories, and from the modern Italian, in its irregularity to suit the exact wants of the inmates. Hence, we find in one part a few arches, where a gallery is required; in another, some windows, or a peep perhaps into the garden, here an open corridor, and there a blank, but all by the mere instinct of an eye alive to beauty, most excellently balanced, and producing a result at once picturesque and harmonious, whilst fulfilling the great requirement of allowing us to put an arcade or gallery, or a window, exactly where we want it, and because we want it, instead of straining the details of one portion of the house because the style requires us to match it with another. The details, too, of the ceilings, wall linings, and floors are very beautiful, the danger in their study being that we might, perhaps, thereby be led away somewhat from the decoration of the style peculiarly our own, the domestic Gothic of the thirteenth and fourteenth centuries.

The study is, indeed, very fascinating, and the more so, perhaps, from the style in its general features, approaching much to our own. Put aside, in fact, the difference of detail, and I might be almost supposed to have been describing our own. But we have, I think, one great advantage in our buildings over any of the Caireen of the same date, viz. in the great comparative masculine boldness which ours possess.

With all the beauty of the Arab style, its masters appear to have wanted the grasp of mind which has produced Lincoln or Canterbury. There are, no doubt, many fine pieces of design, many parts of exquisite beauty, which seem to claim our utmost admiration. But I know of no building amongst all these 400 mosques, these numerous palaces, which is treated otherwise than as a series of fine fronts, or which realizes one grand mass, instead of so many picturesque detached parts.

Even in El Hassan, whose great height, detached position, and unusually bold cornice, would almost claim our homage, the crowning feature, the dome, is very poor; and just at the very point where we look for the bold finish, which we find in our cathedrals, the one before us utterly breaks down, as though it were beyond the power of its architect to bring his whole structure, by its crowning feature, into one grand mass. The idea is that of grace, not power.

As if the Arab could, were a grand design marked for him, adopt it, and work it out with the greatest detailed beauty, but had not the greatest of mind himself to design it; and there is a passage in a celebrated author, Baron Humboldt, which strongly countenances my views.

He says, in one of the generalized descriptions of the Arab race, its progress, and the part that it has played in the world's history, "That notwithstanding perpetual change of place, they preserved their own national character, and the traditional remembrance of their original home; but judging from what they were under the Abassides, they could never have produced those works of sublime poetry, and created art, which are the boast of our Europe."

An interesting task it is thus to try and discover how far a nation's mind is reflected in its arts. Let us try further what may be its results. Throughout the whole range of these buildings the great thing to be observed is their unquestioned, refined beauty. Throughout the whole there is scarcely to be seen a harsh outline, an ungraceful ornament, an ill-contrasted mass of colour.

From their very birth, these Arabs of our time have been used to the grandeur of their ancient Egypt, the beauty of the modern, and the very name of their architecture is a byword for the beautiful in form and colour. But I have ridden for days together through one of the most glorious countries on earth's face, Greeee, where within your time, and mine, an Egyptian army had passed through. Better for that land had been the locust; better for its inhabitants the plague. Their general's orders were to cut down every tree, burn every house, kill every man, enslave every woman and child. And as far as he and his men could do this, they did it. These men were Egyptians,—men from that fair city and those fields, brought up to pray in those mosques, drink at those fountains, and in their daily labour show some latent source of beauty. Is it that the lamp of beauty still burns brightly in these Eastern minds, but sheds no light upon the stern virtues of the heart, or that the Arab race, degenerating as we know it is, retains a mere remembrance only of the graceful, a mere tradition of the past? As a ruin, broken by force, decayed by time, will still preserve some lingering trace of its beauty, though its strength be broken and its form be gone.

One thing more of these Moslem buildings, and I have done. Find them where you will, all are stamped with a mark of intense nationality. Even in Greece, where, from its association with the Byzantine style, we might think to find a great congruity, we can, by the merest vestige of of a building, trace where the Arab foot has been. His is a falling faith now, the Greek and the Russian are on his track, India is in Christian hands, and quietly, scarce noticed, the Englishman has put his foot upon the holy soil, and Cairo is now the stepping-stone between Malta and Aden.

That long black line of rail that marks our path to India will do more than shorten, by some few days, our path to it; and we can almost see the beginning of the end foretold in the brilliant "Eöthen:"—"Islam shall wither away, and the Englishman, straining far over to hold his loved India, will plant a firm foot on the banks of the Nile, and sit on the seat of the faithful."

Even now, the race of the cunning architects who planned these works has gone and left no heritors behind them; and for the new temple in the citadel, the new palace in the capital, the Moslem summons the Englishman or the Greek; and remember that our nation is the only one now spreading itself on the earth; and as the Frenchman, Dupin, tells us, if ever again one race shall make its language universal, the Anglo-Saxon will be that one. Shall not, then, the temples that we worship in, our rulers' palaces, the homes we love, speak to the future of our proud race? And, if we hesitate in this; if we leave the print of the Italian or the Greek upon the land where the power of the Englishman only has been, let us think of the traces that the Greek and the Roman left of their own nation's art in the countries that they peopled,—that the Moslem has left marks in India and Persia, in Egypt, and in Spain, and in their nationalty, though in our own style, let us learn something even from the Arab.

THE SOUTH OF FRANCE.—ROMAN, MEDIÆVAL, AND PRESENT.

Read at the Architectural Exhibition, on Tuesday, May 26th, 1863, by T. Hayter Lewis, Esq., F.S.A.
Mr. B. Ferry in the Chair.

HAVE been requested by your active Honorary Secretary to give a short sketch of my experience in the South of France. The subject is a somewhat hackneyed one, but each man travels with a different object, and views things with a different eye to others, even though studying for the same profession. One goes full of zeal to study the great works left by the Romans; another passes them by as mere picturesque adjuncts to the landscape, and takes the Mediæval works alone for study. Even of these last many branches of study offer themselves. One man may trace the earliest outbursts of the native style, tracing its origin from the Rhine or from the East; whilst another may study it simply as it is, and take from it what elements of picturesqueness or of beauty he may find. The sculpture and the painting to some; the grand examples of old castellated work, the brick architecture, to others; each has its charm—from each, perhaps, something may be learned—and so I trust that, even in a road so well trodden as the South of France, I may find something to interest and instruct.

A sunny land it is, with the deep bright sky and the gay foliage, and the dark brown faces of Italy; and though sometimes its sun be too fierce, and its deep blue sky clouded with storms such as we seldom know here; and though there be sad tales, and sometimes sad experience, of the mistral and the fever, yet all looks so gay and bright in the general, and these Provençals give so kind a welcome to the stranger, that a sojourn amongst them is a thing that a traveller must mark with a bright spot amongst his records. A curious thing is the first meeting with the old famous ruins in these lands. They need no pilgrimage to a deserted place—no guide, as you want in Italy and elsewhere—but you stop at a common railway station, of the year 1860 or so, and above you and beside you rises up boldly and grandly the huge wall of the arch or the amphitheatre which the Roman left there, long centuries back, as his mark on the land of the Gaul.

You walk along the boulevards of the beautiful modern Nismes, where the sculptor Pradier has shown how much and how well art may be lavished on a fountain, and suddenly on its bustling pavement and amongst its gay shops you are brought to a standstill by the temple or the circus—the Maison Carrée or the amphitheatre. Old and new—the skeleton of the past and the living present, are all brought together in these southern towns, all vividly at once. Seldom is the contrast so strong elsewhere. In Italy, for instance, there is little that is new; and what there is seems almost old in feeling.

Then, too, these old commercial towns are unlike our Birmingham or Manchester. With us new towns spring up as a new trade arises, or a new source of it is found, and in a century or so attain to wealth and greatness; and, fond as we are of old laws and old families, and everything that reminds us of the past, the sense of the living present is great within us, and we leave an old town, or sacrifice an old ruin, whenever occasion requires (and often, alas! when it does not require it); and thus it is that few of our great towns have much of the old about them, but have settled bodily down, all new, on some new site. But in this South of France—this country of hot blood and fiery revolutions—you find the great commercial towns now where they were two thousand years ago. The course of trade now runs in the same channel as it did then, and so you meet in the streets and on the bustling quays of the modern town the theatre or the circus of the Roman, and the frowning portal of the Middle Ages, face to face with all the appliances of modern trade; and well cared for (often too well cared for) are the old works.

Cut off from the political part as the people are by their revolutionary changes, they are proud of the old landmarks of time; and if a new street be made or a new quarter opened, its chief direction will be, as at Bordeaux and Nismes, marked out by some feudal tower or ancient church that may be worth the showing: and most are right well worth it.

In beginning to investigate in detail the architecture of these provinces, one feels, I must confess, a sort of satisfaction as one finds that it really has a definite beginning—that one has not to face the history of that mysterious race of people which have given to us our Stonehenge, and Carnac to Brittany; and fond as all are of the mythical and mysterious, one really does feel a sort of secret satisfaction in knowing that one need not even think of anything beyond those matter-of-fact Romans, even though he be shut off thereby from glimpses of such races as the Druids and Pelasgi. So, however, it is in Provence and Aquitaine; and we there start with a clear, well-defined art boundary of the first century of the Christian era at the farthest. Yet, even here, there is *some* mystery; for even with so great a town as Nismes, its origin is unknown, and all that its historian (Clerisseau) can say of it is, that its Roman name was Nemausus, that its foundation had been laid to the Heraclidæ, but that nothing certain of it was known during the thousand years or so from their time to the century before Augustus. It is a wide range, and allows considerable scope for theory. Of the great Bordeaux we know but little more. But be their history in past times what it may, the ruins in them and in Arles, Vienne, and Orange, are some of the finest in existence, and bear separate and distinct witness to that extraordinary fact in the art history of the Romans, viz., that at one clear and definite period, that of Augustus, the old forms of their Architecture, whatever they might have been, disappeared well nigh together, and the ornamental form, which only we now know as the Roman, came into being through the whole empire, from Transalpine Gaul to Greece, and the Syrian deserts to Baalbec and Palmyra. The French examples are much finer than one might expect, and a sight of them is worth some labour, even to those who have seen Roman art in Italy. The Maison Carrée and amphitheatre at Nismes, the arch and theatre at Orange, the theatres at Arles, and the Pont du Gard, are amongst the very finest examples of their several classes, and well worth a pilgrimage to see.

Take, first, the dates. You search, for instance, for the date of the beautiful Maison Carrée, and the antiquaries tell you that you may take your choice between Augustus and Antoninus Pius, a choice of about two hundred years; and this, not only here, but in the other provinces. There is scarcely a ruin in Rome whose name and date and purpose have not been changed over and over again by the zealous antiquary, and its age assigned, according to the theory, from Augustus (B. C. 30) to Severus (A. D. 211).

I have gone most carefully through the study of most of these French and Roman examples in detail, and could scarcely detect a difference in style or carving between the well-authenticated specimens (they are few) of these several dates; and I believe that, go where you will, from Gaul to Sicily, and Greece, and Syria, you will still find the same stereotyped style of design and work through the whole of the Roman empire, for nearly two-and-a-half centuries.

Why, in that same space of time as spanned the dates from Augustus to Severus, our Gothic styles of England, France and Germany had passed through all their chief phases. It is the time from William I. (1066) to Edward II.—from Rochester Keep to the Chapter-house at Wells (1293-1302)—from the Romanesque Apostles' Church of Cologne to the decorated work of its great Cathedral (1248)—from San Miniato at Florence (1013) to Sienna (1260); and more remarkable still is the fact, that although we are told that the Romans brought their artists indifferently from Etruria, Sicily, Asia Minor, and Greece, yet the difference in the style of France, for instance, with that of the far distant provinces is so slight as scarcely to be seen. I doubt if the veriest antiquary could say of the works of Arles or

Nismes wherein they showed provincialisms to separate them from those of the capital or of Greece. It has not been so since. The art of every nation has been modified in its several provinces by local art and local inspiration. The Norman quickly saw his style resolve itself into the Early English of our own land, into the first Pointed of France, and into the curiously mixed style that we find in Sicily. But with the Roman it would seem as if by some art edict of the first century, one form had been stereotyped for the empire—for France as well as for Rome—and that the temples and the amphitheatres of Nismes, and Arles, and Orange should have the plan, and arrangement, and details all cast in the same rigid mould that impressed all Roman art till its decay. It would seem, too, by one curious case (the amphitheatre of Nismes) as if the design had been sent from afar, and badly carried out by some one on the spot, who worked slavishly and badly, from a copy; for the pilasters of the exterior have their returns all rigidly worked to a radius from the centre of the oval, thus projecting at most discordant angles from the wall; the result being awkward in the extreme, and one that no master in the art could possibly have worked out.

Another thing strikes one in looking at these Roman ruins. You can see no individuality in them, as you can in the works of other styles—nothing (to put a parallel case) to match the particular varieties shown in Florence, Ravenna, Lombardy, or Pisa, &c., to show that any particular man or any particular province had left his or its mark on the architecture of the time.

There are drawings (exhibited on two screens) to show the varieties of Roman mouldings at Nismes, as compared with those of other buildings in other parts of the world of about the same date; and I think that you will see no traces of the same varieties that you would meet with in other styles. Take, too, the general mass. The amphitheatre at Nismes is 433 feet diameter (largest), held 17,000 spectators, had 60 arcades, and 2 stages in height. The Colosseum, and that at Verona, were much larger, and 4 stages in height, and so on with the others. But the variation was merely in the stages and the size, not in the design. Large or small—in France, Italy, Dalmatia, or Sicily—you have row upon row of arcades, one order upon another, upon one stereotyped elevation and plan. So, again, with the temples. The Maison Carrée had only more or less size—a greater or less number of columns—than the many hundreds of other temples which studded the Roman world; but that was nearly the only difference; and a Roman of the first to the third century might worship in that temple in Nismes and see no difference from one of his own.

It would really seem as though in the earlier times of the empire there was a sort of central power in art which ruled the whole, and fixed it down to one arbitrary model, somewhat in the same way as architecture was ruled in the Middle Ages, although, in the latter, it was changed in style, mouldings and all, in every century. It is a subject much studied, oftener guessed at; and the result is, I think, that at present we really know nothing about it, and the fact remains still to be explored. But one thing we must give credit to these Romans for—there's no mistake as to the purpose of their works. Take that amphitheatre, there, of Nismes or Arles, and see what a rugged boldness there is in every part of it. You could put no delicate ornament on those arcades—they are too rude and bold for any such finishing. But take the temple, a few yards only from it, in the same town, and nearly the same age, and see how delicately graceful every detail is by comparison. The Roman wanted a stern, bold look to mark that fearful circus in which men died by hundreds in cold blood. He wanted a softer, more graceful look for the temple of his gods; and go where you will, from this province to the utmost limits of the Roman power, you will see these marks on the circus and the temple. You will see, too, that all they did was Roman, and nothing else; and be their architects French, Etrurian, Greek, or Asiatic (and we know that they were all, at times), all lost the memory of their early training and the traditions of their native lands, and left nothing of their works but what was solely and intensely Roman.

Soon after the fourth century their strength seems to have died out, down South, in France; for I know nothing after that worthy of their name. Some few remains do, indeed, serve to link their memories with those of later date; but the porch of the cathedral of Avignon is the only one that I can cite as really debased Rome; and the façade of that of Nismes I take to be clearly an early Mediæval imitation. That Avignon is actually Roman, though debased, I have no doubt whatever, however much one may hesitate at opposing an opinion given by Mr. Fergusson. But, set these few doubtful instances aside, and you may make a clean sweep through all the space from the fourth to the tenth or eleventh century, and find no object of art in your way, beyond the excavated chapel of Montmajeur and some early Christian works of the same rude class. Within that time the Goths, in the fifth century, had settled in Aquitaine, with Toulouse for their capital. In the sixth century the Franks, and in the eighth century the Saracens, had overrun the country, been beaten, retired, and re-advanced, until finally it came to a settled state, probably about the eighth century. Within this said blank space of some six hundred or seven hundred years, art had done much in other countries. In Rome, there were the great basilicas of the Lateran and S. Paul; in Ravenna, the picturesque and grand churches of S. Vitale, and the three Apollinare; on the Rhine, Lorsch and the finely outlined old churches of Cologne (a mine of study not yet well worked). In Constantinople, the Christians had reared S. Sophia; and, in Cairo, the Arabs had erected the Mosques Amrou, and El Azhar. Starting at this lapse of time into life again, fresh from a desert waste of art, it is curious to trace now the first beginnings of art-life in Provence, connected as it was by situation, or by commerce, with Spain, Italy, Germany, and the East. Was it a product of its own land, or was it borrowed? if so, whence?

Now, I must first ask your attention (for my present purpose), to some few examples only wherein the Provençal characteristics are well-defined, and take them for examination, in place of alluding to a greater number. I shall limit myself *here* almost entirely to Provence, as the neighbouring districts are better known, and have been admirably described by Mr. Pettit and Mr. Street. And I will take the cathedral churches of Valence, Avignon, Arles, and Carcassonne, and the beautiful little mortuary chapel of St. Croix, Montmajeur. Of these, the date of the latter, 1019, is known, and so is that of Carcassonne, 1066. The rest we may, I think, safely take as about the beginning of the eleventh century, being thus about contemporaneous with S. Miniato, at Florence, Pisa Cathedral, S. Sernin at Toulouse, the abbeys at Caen, S. Gereon at Cologne, Rochester, Hereford, and Ely. These Provençal cathedrals have, for the most part, in common, a cross plan, round arches for the subordinate parts, piers for the aisles in place of columns; these piers carrying bold arches, slightly moulded (sometimes quite plain), on which rests a low wall without triforium or clerestory. The aisles are generally groined without ribs; but on the plain wall of the nave rests a pointed barrel roof of excellent masonry, supported by square ribs, as shown in the drawing of Carcassonne and Valence. The section of the mouldings is, as shown in the drawings of them, quite Mediæval in section in some cases, with quite Roman characters in others. But the ornamentation is almost entirely copied traditionally from the local Roman remains. To add to these peculiarities, we have the early use of the dome combined with the barrel vault, in Avignon, and of the curiously-formed structure, half-dome, half-groin, of the chapel of Montmajeur. I give a drawing of the Avignon dome-springing (for the dome itself is destroyed), enlarged from a careful sketch of my own. Here the fine barrel roof is carried by large pointed arches; but these, in their turn, support round arches carrying the drum of the dome, this latter being carried up from an oblong plan by a series of arches, which contract the oblong into a square (an unique instance, to my knowledge); and out of this square the octagonal drum of the dome is worked by small cross niches, in precisely the same way as you find it in the early churches of the Rhine, and on the same principle as it has been done from time immemorial in the East, and at every church or building that the Arabs have left wherein the honeycomb was not employed. No such pendentive exists, to my knowledge, in any work of the Byzantine school, though effective and picturesque in a very high degree. Some few other peculiarities may be noticed: such as the singularly elegant buttresses at the chancel of Valence, as shown in the small sketch kindly lent to me by Mr. Waring We have further that very interesting old mortuary chapel, St. Croix, at Montmajeur, near Arles. This was undoubtedly completed in 1019, as the date is well authenticated. The details are, to a great extent, traditional Roman—the outline altogether foreign—and, as I take it, from the North. You will remember a tomb-house, now called the baptistery, at Ratisbon, almost identical in plan with this; so are many of the ends of the early Rhine churches—Mayence Cathedral, for instance.

We have also many examples of a somewhat similar plan in Northern Italy, more especially where influenced by Byzantine, as Venice and Ravenna; but there is also so much of a strangely Eastern type in the early architecture of Germany, that one is puzzled to say, at a point of confluence like this, whether its origin was from the North or East. There are many other well-known examples which I could quote and describe, such as Beaucaire, Vienne, S. Gilles, and others; but I do not particularly allude to them, because those which I have described, present sufficient specimens of the leading features of the style.

The most marked remaining peculiarity of the southern churches I must now allude to, is the richly-sculptured portals, such as those of S. Trophime, S. Gilles, and Tarascon—works varying in date from the beginning to the end of the twelfth century—all boldly recessed and ornamented with a profusion of statues of large size, and of great value and merit in point of art. Their sculpture has been studied by Mr. Waring with great care, and was carefully described by him in a Paper read at the Institute in 1860. Other examples exist, doubtless, with which I am not acquainted. And these portals expanded gradually until they were developed into those magnificently-enriched doorways which so characterize the great French cathedrals, and, in a less extent, some of the northern Italian. The nearest of these in point of date to which I can call your attention are, perhaps, those of Strasbourg and Bourges in France, the Scotch Church at Ratisbon, and S. M. in Toscanella, and cathedral of Verona, in North Italy. The earliest of these seems to be of no earlier date than S. Trophime, Moissac, and S. Gilles, and can at least lay no claim to having preceded the South of France in their design. In fact, I cannot call to mind one instance of any work in any country from which these portals can be said to have been borrowed; and I think that Provence may, most fairly claim the entire merit (and it is a very great one) of their design; for anything more bold and picturesque in mass than S. Trophime, for instance, more graceful in outline, and more artistically combining architecture with sculpture, one can scarcely conceive. From what original type they were elaborated it is now impossible to say. Certainly, there is nothing in the remains of Roman art in their country, or in any other, so far as I am aware, that would serve to show it was Roman.

But their date was also that of a general enrichment of the grand entrances; and the lions and other animals under the feet of the statues of the porches of S. Trophime and S. Gilles serve to show a connection at once, by their conventional treatment, with the architecture of the entrance portals of such churches as San Zeno at Verona, and others of that type.

Now, in taking a general review of the few examples that I have quoted, we find in these comparatively small churches, unimportant enough in point of size, a remarkable number of most valuable peculiarities and elements of massive beauty. We have the long barrel roof, the free use of the pointed arch in Romanesque work, the deeply recessed and sculptured portals, the use of the dome, and the use also, of the complete pediment, with the horizontal cornices, in place of the mere enriched gable cornice seen elsewhere in Mediæval work. The style seems to have existed scarcely long enough to have developed itself kindly; but one feels curious to trace its origin. I confess that I think the Provençal architects may take credit for it, for the most part, and I only wonder that so good a beginning should have come to so untimely an end; for, after the fourteenth century, architecture seems suddenly to have died out for many a long year in Provence. The peculiar dome came, I think, for reasons already given, from the Rhine; but of the pointed barrel vault, which is so marked a feature in Provence, there are comparatively few examples outside Provence and Aquitaine. There may, no doubt, be instances in Northern France, but they are unknown to me, and have not, so far as I am aware, been described. We have ourselves, the well-known instance of the chapel in the Tower, many years after the latest date at which one can put these Provençal roofs. We have, also, several other scattered instances, but they are quite special; whereas, up to the twelfth century, they were used almost exclusively in Provence. In other parts of France we have them also, as in the well-known examples of Le Palud, Civray, and others in the south and west; but I cannot see that they owed their design to any introduction from the neighbouring districts or from the Rhine, or of the other side of the Alps. In Germany we have Mayence, Spires, Worms, Bonn, Cologne, all groined; and in Northern Italy we have San Zenuone, Michele at Pavia, S. Ambrogio, and others, either groined or with timber roofs. These Provence vaults, too, are all pointed in section, the date of the vaults being some two centuries before its general use in England; or, in fact, in Europe generally. A few years since the mere fact of the vaults being pointed would have been held sufficient to prove their date to be not earlier than the twelfth century. But Mr. Fergusson and others have so clearly disproved the necessity of this assumption, that there is no need for us to consider it as proving a later date than I have given. Mr. Fergusson considers that the form arose from the superior fitness of it for the external covering. I beg to suggest an additional reason—viz., the great extra strength which the pointed vault has over the round one. We all know practically, that an arch which, with a definite thickness of voussoir, would burst at the haunches, would stand strongly and well in a pointed form. In fact, I look upon this form as a case almost of necessity in the absence of strong buttresses, or of so great an abutment at the base as to form an inconveniently extended mass. The difficulty is, of course, to be surmounted by forming the upper parts of a very light material and weighting the lower part, but this is a refinement of construction of later times. This covering is of so useful a form outside, and so simply graceful in outline inside, that one wonders it has not been more often used. The form went out, no doubt, when the heightening of the churches, and the general use of the triforia and clerestory combined, required the roofs to be pierced. Directly this happened, groining, to some extent, must, of course, have been a necessity. We have a curious instance of this in the little church of S. Emilion. Comparatively few churches, however, are of a size to require both these accessories, and the ungroined vault is there used without difficulty. Another peculiarity in these southern churches is the use of the horizontal cornice completing the triangle of the gables, as the ancient pediment was completed. We see instances of this kind at the cathedral at Nismes, and at the gables of Montmajeur. There seems little doubt that it was also the case at S. Trophime, but that the centre part was cut away to make room for a modern inscription. The same peculiarity occurs in some few instances in Italy, as S. Pietro in Toscanella, in the middle of the eleventh century, and also on the Rhine. There, as in the baptistery of Bonn (a somewhat similar building to Montmajeur), at Laach, Zinzig, and others, we find very much the same outline as at Montmajeur, &c.; but, elsewhere, we have invariably, in Mediæval work, the gable cornices ending abruptly, or tied together, as it were, merely by some enriched bands. Oftener, as we all know, there is no horizontal connection whatever.

Now, of all the peculiarities that I have noticed, we may, I think, clearly assume that the vaulted roofs and the enriched portals are decidedly due to the native architects. Whether the pointed form of the vault was also native, suggested by the constructive necessities of the case, as I believe, or whether it came from the East, it is now impossible to say; but I have little doubt that the peculiar dome pendentives came either from the East or from the Rhine—certainly not from Byzantium, for, if they did, we should trace them down in some way from the Byzantine colony established at Limoges in the twelfth century. But nothing of the sort exists there, so far as I could ascertain on the spot. We have, however, the high authority of Mr. Waring for saying that the Provence figure sculpture has a very Byzantine character, and we may well believe that Constantinople sent art sculptors to France, as she did mosaic workers to the East, to adorn the buildings which the native architects had erected. Anyhow, we may safely accept Mr. Waring's judgment in the matter, and assume that the sculpture came from Byzantium, the details of the mouldings being traditional copies (and sometimes very good copies too) of the Roman works by native artists.

I must now call your attention to some civil and military works in the province, viz., the palace of the Popes at Avignon, and the walls of Avignon, Villeneuve, and Carcassonne—all of the thirteenth or fourteenth century. Than the Mediæval fortifications of Avignon, nothing more picturesquely bold can be imagined. They are so boldly machicolated—so grand in outline and so varied in form—that one feels a sort of irritation against their modern successors, which give us the wretchedly low uninteresting earthworks which are now said to guard our modern towns.

The Avignon walls date from about the middle of the fourteenth century, and put us in mind of the frieze fortifications of Tolentino and such like towns in the Italian marches. And, as Pope Clement constructed the Avignon walls, it is likely enough that their design may be owing to an Italian architect; the more so, as the heavy corbelled parapets were little used in France up to this date, the machicolations having been formed in wood until the end of the thirteenth century, with the exception of Auvergne, where stone was used a century earlier. But in another town of Provence, Carcassonne, we have the true French type of fortification of the thirteenth century. The walls throughout are nearly perfect *where not restored*, and, with the bold masses of Avignon in one's mind, have a somewhat feeble look, owing to the absence of the massive crowning corbelled parapet to which we are accustomed. The curtain walls are simple, plain, unbroken masses of masonry, whilst the towers that break their line, though picturesque beyond almost any other plain example, have no further termination than a slightly projecting eaves cornice, from which springs a high and conical slated roof. Mons. V. le Duc, as you well know, has exercised great ingenuity and research in planning the restoration of these walls, and has published most elaborate restorations of them in his "Dictionary," and in the national work produced under the auspices of M. Achille Fould. He there states that the upper parts were finished by timbered galleries, and has illustrated this restoration in a very interesting way in both the above works. The portions of the actual work, however, restored by him at Carcassonne, present nothing of this; and, the slight, slated roofs, which now finish the towers, have a most painfully meagre look; though it must, however, be said, in justice to him, that the remains both here and at Bordeaux justify his restorations as actually carried into effect at Carcassonne. The other great work in Provence is the palace of the Popes of Avignon—a gigantic pile of the fourteenth century. It was half palace, half prison, with little of the beauty of the one or the massive grandeur of the other; and however interesting many of the details are, more especially of the interior, it owes its interest, I think, chiefly to its historical renown, and few would care to sketch its gigantic barren walls, except as they group picturesquely with the neighbouring cathedral and bridges. Before leaving Provence I must call your attention to one more peculiarity, which it shares, to a considerable extent, with Aquitaine—I mean the enormous, wide spanned churches of one single aisle only on the plan, though on an enormously enlarged scale, of that of Avignon. Such is the great church of the lower town of Carcassonne, whose clear span must be 60 to 70 ft.; the nave of Toulouse

Cathedral, the span of which is still wider; and the nave of the cathedral of Bordeaux, 60 ft. in span and 200 long. These churches have plain groined ceilings, and are, I suppose, about as bold and successful pieces of construction as one could well find; but no one, comparing them with the aisled churches, would wish to change the latter for these great plain rooms, although they have in the deep side altars a means of procuring bold shadows and decoration, and affording a massive abutment to the thrust of the groined roofs; and if the aisles are to be given up, as some propose with us, in order to give a clear and uninterrupted view, these southern churches offer models deserving of careful study. To make the contrast complete in the cases of Toulouse and Bordeaux, the choir has been added, with aisles, to the aiseless nave; and no one seeing the two thus brought directly together could possibly hesitate in deciding between them. The difficult problem of the best form for our Anglican churches will not be solved by copying these southern ones; but no one entering deeply into the subject must overlook them. I was not able to get a section of these enormously spanned roofs; but they seem to be fine pieces of construction, and I could see no sign of failure, though most of them, including the ribs, are of ordinary bricks.

I shall have to allude, shortly, to the very interesting cloisters of S. Trophime, at Arles, of various dates, from the thirteenth to the fourteenth centuries. But, beyond these, and the remains at Avignon and the beautiful choir of Carcassonne, there seems no pointed work of any great interest in the province, whose skill in architecture seems to have suddenly stopped in the fourteenth century. In fact, the interest of Provence is in its Romanesque and thirteenth century work; and it is only at intervals, after their time, that one gets a few straggling examples of later styles, and I shall not detain you with any further allusion to them. Temptingly near to Provence lie Auvergne and Aquitaine, and the southern part of Anjou, with those interesting towns Limoges and Perigeux; but, most of these have been already well described, and I shall content myself by alluding to a few general points of interest.

With respect to the best known work, S. Front, at Perigueux, you had better lose no time in going to see it if you wish to see it all. Most part of it is now nineteenth century work instead of tenth; and the student may well give respecting it the same sarcastic reply that the American gave as to the restoration of the Colosseum, "It will be a fine building when it's finished." It was about half-finished, *i. e.*, half-rebuilt, when I saw it no long time since; and if you are very quick, you may, perhaps, arrive in time to see some of the old sculptured work before it is broken up for lime. Mr. G. Scott tells me that he tried, since I was there, and had no little trouble in seeing any even then. However, the great characteristics, the pendentives of the domes, remain or have been reconstructed like the old; and one sees, in a moment, that they are genuine Byzantine, and quite unlike the Avignon type, betraying, in fact, completely, their Venetian or Byzantine origin. The Venetian colony founded at Limoges in the twelfth century, accounts well enough for this; but it was too late to have much, if any influence, upon the architecture of Provence, most of whose characteristic works are of earlier date and seem to owe nothing to the Byzantines but some of their sculptured accessories.

I shall pass over this S. Front style, for it is well known and has been so often described that I should weary you now, perhaps, with the repetition, and I give you as specimens of the Romanesque work of Aquitaine, S. Caprais, the Cathedral of Agen, S. Croix and S. André, at Bordeaux, S. Etienne (before 1218) and S. Sernin at Toulouse, and the singular church of Moissac—all of the eleventh or twelfth century.

Now, the first thing that strikes one in most of these churches, including that of S. Front, is the free use made of the pointed arches at a time when they were scarcely used at all in England, Germany, Northern France, or Italy. But here we find them quite naturalized and evidently been in use some time. In S. Front, of the eleventh century, all the main arches are pointed. At the beautiful church of Agen, nearly all the main arches are also pointed; and, after a very careful examination, I had every reason to suppose that they formed part of the same original work as that wherein the round arches occurred. At S. Sernin, Toulouse, and, at Agen, again, we have the barrel roof in one part and the groined roof in another, pretty well contemporaneous so far as I was able to judge.

At Moissac, the cloisters, dating, it is said, at the early part of the twelfth century, have all the arches pointed. These pointed arches certainly did not come, like S. Front's design, from Byzantium; but the ease and grace with which they unite in outline in work of the same period, with the round, may give us a useful lesson in our use of them when we need them.

The next peculiarity is that of the great churches without aisles I have alluded to already. Both at Toulouse and Bordeaux cathedrals they are put in direct comparison with the aisled choirs added in the thirteenth century, and the picturesque effect of these latter place the inferiority of the plainer plan in a very striking point of view. Next to this, we are struck with the wonderful amount of sculptured ornamentation lavished on some of these churches. S. Front, indeed, is plain enough, but Moissac S. Croix at Bordeaux, and S. Sernin and S. Severin at Toulouse, have a wonderful amount of sculpture.

Throughout all the Romanesque work of Provence and Aquitaine that I have described, we get no regular eleventh or twelfth century work, such as we are used to in more northern parts. I do not remember, for example, one single instance of a cushion capital. Such ornaments as the chevron, tooth, beak moulding, &c., which we find not only in Northern Europe but so far south as Sicily—wherever, in fact, the Norman was found—are comparatively rare. Altogether, we may, I think, class it as nearer to the Lombardic work of Northern Italy, than to any other; but I believe that the one owes little, if anything to the other, and that what little of the work of the South of France was not the result of native art, came as much from the Rhine as it did from Byzantium or the East. This Romanesque work in Provence is of no great importance in actual size or amount, but contains, in common with the more important Romanesque work of Germany, a vast amount of material for suggestion. Many of my hearers, and, many, too, who can admire the Mediæval remains in general, quite think, no doubt, that our modern usages so utterly differ from those of the eleventh and twelfth centuries, or that their comparatively rude work had been so altered and improved, and so worked out and adapted in later times to later requirements, that this old work is scarcely worth the trouble of dissecting. To me, I confess, the feeling is quite different. I think that there is an amount of real genuine knowledge to be gained by the study of twelfth and thirteenth century work, which makes it gainful and interesting beyond even that of the more beautifully finished and elaborate work of later times. True, all this is rude and rough, the sculpture wanting in grace, the mouldings in elegance, and the whole work, outline and details, wanting the finish of the Romans before and the Gothic architects after. But we see in this same rude, rough work a bold masculine power of design, which seized on all the appliances within its reach, and used them indifferently, unfettered by the ties of any style to the required purpose of ornament or of use. They used the round arch where they wanted it, and the pointed where they wanted *that*. They took the spire-like form and contrasted it with the dome, as one sees so constantly in the Rhine churches. They used the groined roof, as at Agen and Toulouse, and on the Rhine, or the barrel vault as at Arles, and Avignon, and Toulouse, and all done with so skilful an eye for effect that the result is a fine, bold, strong outline, strong in contrast and yet not harsh.

Now I say that, with no wish to copy, we may learn no unprofitable lesson from this, at a time when fixity of design and fixity of style can scarcely be said to be characteristics of our art; and I will go further, and say that from these twelfth and thirteenth centuries we may get some lessons of real practical value for our every-day practical work.

I never yet saw, in any church that it has been my lot to visit (and I include boldly in this the churches of Sir C. Wren, held up to us as models), any plan worked out so well for our Anglican worship as many of the great Rhine churches of the twelfth century—the Apostles' and S. Mary's at Cologne, for instance. And, take the old sculpture: think of the Roman Maison Carrée, and then on its rude successor in the cloisters of Arles. It's a bold comparison. I do not wish to say one word against the skill and the beautiful carving of the Corinthian capitals of the Roman temple—and no one can admire more than I do the fine effect of the continuous range of these capitals and columns, all alike to a hair's breadth, which build up the graceful outline of the Greek or the Roman temple—but then, when you have grasped this effect, you have all. Look at the work in detail; and when you have seen one capital or one length of cornice, you will reckon it a sheer defect to find that it differs, no matter how little, from the rest. No art workman could go over the ground in this way, over and over again, and care much for his work. But to take any other illustration: at Arles, each capital there is a separate study, worked out with care and skill. You have a veritable sermon in stone as you walk round the cloisters and see the Bible history traced gradually round it. A workman might take pride in that; and no workman who did not care for his work could make much of a hand of it. I don't say that we are to copy Arles; but I do say that these Arles workmen were in the right way, and that our art sculpture would be of a higher kind if we went some way in following them.

It seems strange that, when the French architects of the Romanesque times had got so far as to design and execute S. Sernin at Toulouse, and the Germans their great cathedrals of Spires and Worms, all this work should be suddenly stopped and a new style at once begun; but it certainly was so, and these splendid works fell back into the past and left scarcely a successor.

Of the Gothic works that followed, my time will allow me to say but little, though many of them, as the choirs of Carcassonne, Bordeaux, and Toulouse, and many of the other churches of the same date, are of very good and even fine character. I have given some sketches from Toulouse to show some very elegant examples, and how very eccentric some of them are—in fact, any drawing does not, from its small size, show well enough how very eccentric this last is.

The South, however, is not the place for studying the pointed architecture of France, and I shall not, therefore, detain you with it.

I must say a few words upon the modern architecture of France. It is a large subject, for in every town that I have seen the same sort of work is going on as at Paris; for it is quite a mistake to think that the Emperor gives his attention to Paris only—Lyons, Bordeaux, and other great towns come equally under his care, and new streets are there being cut, and new public buildings erected as at Paris. I need not describe the style, for throughout the provinces the same prevails as one sees throughout the new streets of the capital. One can scarcely give it the credit of great boldness or much novelty, its chief features being very delicately cut moulding, with a good deal of graceful ornament, the projections being slight, and almost the only variety given by projecting balconies, often of very good design, and by dormers carried up more or less boldly. In some cases, as the Palais de Commerce at Lyons, the Palais de Justice at Montpellier, the Theatre at Avignon, the mass is treated with more originality; but, generally, the chief attention is given to the delicate finish of the details which the clear air and bright sun of France bring out well, but which would scarcely do in our climate even if it were wished. Be it good or bad, however, the French seem to have worked out and to have adhered to this style, quite irrespective of anything before them; for there are few, very few, of their works that would remind us that they had (to go no farther even than Paris) such works as St. Germain des Près, or Notre Dame, or the Temple, or that grand old building the Hotel de Ville.

As to the general arrangement of the Southern towns, it is a question now really to be deeply studied by us, for not only is every town of note in our country being rapidly enlarged, and new towns under the name of suburbs, being added to it, but, for the first time for many a century in our country (and nowhere else, so far as I know, in the old world) are new towns being founded, *ab initio*, on the waste, or the sea sand, as have been in our time, Birkenhead, Fleetwood, and Crewe, as though the old times of the colonists had come again, and it is our part to see that the old town is improved, and the new well designed, so far as lies in our power. Now, take the case of a traveller in an English town, confined to it by ungenial weather or by business, and, when the day's work is over, or the old church seen (if there be one), what more is there to see? The answer was, until quite recently, very simple—nothing. But in these French towns one may reckon pretty safely, even in those of very inferior size, to find a good museum of local antiquities and some very tolerable paintings. But the chief thing to be admired, so far as external look is concerned, are their public gardens, always placed so as to command, if possible, a fine view, most carefully planted and attended to, and with almost invariably some statues or fountain really worth seeing, and on which the art of some of their best sculptors has been employed.

I must now ask your attention for a short time to the restorations now proceeding with the ancient buildings of the South as well as of every other part of France, and I shall confine my notices to those to which I have already alluded, and which I have myself seen. It is a matter of great moment, for there is not one building that has not been or is about to be rubbed and pulled about and repaired, sculpture and all, until nearly every trace of its antique look is gone. These fine old walls of Avignon are now having their turn and being rubbed, scraped, and brought to look as bright and new as though they were put up yesterday.

The two transepts of S. Front, Perigueux, have been rebuilt almost entirely, and I looked in vain to find one capital even that had been spared. In the amphitheatre of Nismes, the old seats and podium are being rapidly pulled down and rebuilt, not cut out and restored, as we should do it, bit by bit only.

Arles is left for the present; but Carcassonne is sharing the fate of Nismes and Avignon. Those parts commenced upon are being, in fact, utterly rebuilt, so that no vestige of the old can be distinguished so as to settle the point (in many cases very doubtful) as to whether the restoration is a faithful one. Much of the restored work of the Romanesque parts of Carcassonne Cathedral, for instance, is open to very grave doubts. In the courtyard of the cathedral I saw three very fine windows of large size put out regularly on the ground. There was scarcely a stone in them that could not have been used again; but I find that they were merely laid there to be more easily copied, and that new, with clear sharp arrises, were to be worked in the places of these time-worn, but still almost perfect old ones.

But the strangest case that I have yet seen is that at the very interesting old church, S. Croix, at Bordeaux. I saw there, hanging up in the choir, a drawing of the proposed restoration, and took a rough copy of it. It is proposed there, to re-arrange all the windows, doors, and arches of the front, which is a very irregular plan, to finish the tower and the front according to the architect's notion of what it ought to be, and to add on another tower, all quite new, at the west side, so as to match in design with the old work. I saw the foundations dug out for this; and most certainly, there was no doubt that no tower or work of any sort had ever existed there to warrant this restoration. Now, when we can clearly see from existing remains what the original design was, I, for one, should no more object to its being now carried out, than I should object to the completion of Cologne Cathedral.

But when an old work like S. Front or S. Croix is rebuilt, the new parts, be they never so closely copied, will be *but* copies; and when they are subjects more of archæological interest than of intrinsic beauty, their value is gone; but to invade an old work like St. Croix, to alter and re-arrange and to add to it, in the very face of the knowledge that the new work is a new design and no restoration at all, is to remove altogether one of the landmarks in the history of art; and we see the old church as improved and re-arranged by Abbadie of Angouleme, whose design we do not want, in place of the old which we do—work that had come to us direct from the hand of the old monk who reared it, and had left the mark of his time and of his race cut deeply in every moulding and carved in every leaf.

ARCHITECTURE IN FRANCE—MEDIÆVAL TO RENAISSANCE.

Read at the meeting of the Architectural Association, by Mr. T. HAYTER LEWIS, April 1st, 1864.

A HISTORY of architecture in France is no light matter to give to this audience. Its leading features, and very much of its details, have been already most admirably set forth by such writers as Petit, Freeman, Fergusson, Scott, and others of our own country; and by De Caumont, Viollet-le-Duc, Verneilh, and other French authors; and there are few, perhaps, of my audience who do not well know not only those works, but the examples themselves, from personal study in France.

Much, therefore, that one would ordinarily dwell upon would be a mere waste of time here, and I trust, therefore, that I shall be excused in speaking to a greater extent than I usually do of those particulars, which have struck me the most forcibly in my own French studies.

Now, to begin with, I must ask you to call to mind the well-known fact, that France never did, from the earliest to the latest of the Mediæval times, exist as an architectural whole. We find great local peculiarities in England, between even the different counties. Extend the studies to the sister kingdoms of Ireland and Scotland, and the peculiarities are seen still more strongly. But Mediæval France was broken up into various schools of art in a much more determined way. It was never, except in a few rare instances, one kingdom at all, politically,—not subject to one ruler,—not obeying the same laws.

Clovis found at his accession that his southern boundary was the Loire. He passed that, and pushed his confines on to, and even beyond the Garonne. Burgundy was added by his son. Charles Martel did nearly the same; so did Pepin; and so, after him, did the still more renowned Charlemagne, who ruled at his death what no French ruler except Napoleon, ever did before or since, *all* France, with a great part of Italy, Spain, and Germany. But after these great monarchs, France was dismembered by their several sons; Italy, Spain, and Germany were eventually lost; and Mediæval France, such as her kings ruled in the twelfth century, really comprised only what was left of the kingdom when Brittany, Normandy, Burgundy, and all else to the east of the Rhone and south of the Loire was cut off.

And we must remember that this was not merely so in name: that these provinces, owning the French king as their feudal chief were not really his vassals. These provinces were, *de facto*, distinct kingdoms, allied with their feudal chief when it suited their purpose, and allied equally often, for the same reason, with his enemies; and the counts of Brittany, Normandy, Burgundy, and Aquitaine, warring as often against the king as for him, and thus keeping up the national feeling of their several provinces in opposition to a united France, drew strongly a line of boundary to each for art as well as for war.

It was not till Philip Augustus and S. Louis (1226—1243), at the beginning of the thirteenth century, that the king of France was really the ruler of the greater part of it, as we now know it; and even after them France had to go through the fiery ordeal of our Edward and Henry, and saw Brittany, Normandy, Burgundy, and Guienne still and again defy him. Then, again, in England, ours was the architecture, mainly, of one race. The Roman work was well-nigh destroyed before our architecture, as we find it, arose; and exercised no influence whatever upon it. But in France, the Roman work remained bodily before the eyes of the Mediævalists. Even now, you enter Rheims, or Autun, or Bordeaux, by or near the old Roman gateway; you may still see bull-fights in the amphitheatre at Nismes, and may worship the arts there in the temple where the Roman bowed down to his gods. In fact, the Romans themselves, like their architecture, seem never to have quite died out, but to have amalgamated, in the south especially, with the conquering races. Many proofs of this will be found, directly stated, in history. Then, again, there came down streams of emigration from the Rhine and down the Rhone, the Rhenish arts and architecture coming down with the streams, as we English carry them to our colonies. Then, again, there came up from the sea, through the southern ports, whatever the Venetians could bring from Byzantine, Venice, and whatever the Easterns could send from Saracenic Syria and the Nile; not mere goods and merchandise, but arts and the men who practised them, and who formed goodly colonies at Marseilles, and Narbonne, and Limoges, much as we English do now wherever the doing is worth it. Then, too, in the north, were the Normans working out in their own province, Normandy, their own peculiar style,—the only one, so far as I know, of Mediæval times clearly belonging to the name, and to be traced wherever the Normans went, in their own land, in England, in Sicily, distinctly, to them and to no one else. So that, with all these facts together, we may well hesitate at tracing French history in a part of an hour or so.

Yet I willingly have dwelt, at some little length, upon this beginning, because it really forms the basis upon which all knowledge of such history must be founded; and because, too, it shows how little an architect can expect really to know, if he venture beyond mere bricks and mortar, without being well grounded in history. Not only the history of France, but, we must know something of what was practised at the time in Germany, Venice, Constantinople, and the East, before we can enter very deeply into the matter. Without, however, detaining you more as to this, I may state broadly, as an introduction to French architecture, that between architecture as practised by the Romans and as revived in France, in later times, there was a clear, deep gap of some six centuries. For the latest time assigned to any Roman work of note is the third century, whereas the earliest Mediæval work that we know of, as worth caring for, bears date about the tenth. That is a long stride, that same six centuries; Goths, Franks, Saracens, had overrun the country then; Charlemagne, the great emperor, had ruled and died, and his enormous kingdom had been scattered to the winds; and, as we come upon France at the awakening of art in the tenth century, we find its king governing no more than one of its large provinces.

Now in all this great space of 600 years there is scarcely anything, from one end of France to the other, of importance enough to have obtained celebrity.

A few remains of some little interest may, indeed, be cited, and they are scattered widely over the country, from the Basse Œuvre at Beauvais, in Picardy, to S. Jean, at Poitiers, and Coustonges in the Pyrenees. But the dates of these buildings are very doubtful, and the remains too scanty for successful theorizing, and all that we know beyond the Roman character of the detail is, that the nave and aisle arrangement with clerestory above was clearly, though rudely, even then in use; so, too, apparently was the dome; and that the masonry most in use was that of small stones, carefully bonded, and often arched with courses of Roman tiles.

It will assist us in our estimate of the arts in France at that time, if we call to mind that in England we had Brixworth, Wearmouth, and Jarrow; that in Germany there were Aix la Chapelle, and the portico of Lorsch; in Italy, S. Vitale, S. Prassede, and one at least of the fine brick towers; and at Constantinople, S. Sophia's. So that our art then in France was sadly in arrear, and that is about the sum total of our knowledge both of the character of existing works and of their dates. We get in the tenth century on somewhat surer ground, for we have then, as examples, Tournus, S. Etienne, at Nevers, the Abbey of L'Ainay at Lyons, and Note Dame de la Coûture at Le Mans.

As to the latter, however, I have very strong doubts, and as the presumed age of the oldest part is almost the end of the tenth century, we may, I think, safely refer the building, generally, to a later date, and so remove it from our present consideration. The rest of these churches are more particularly within reach of German influences. At Lyons there is the dome, together with a singular arrangement of sculpture over the aisle columns; and at Tournus an almost unique example of vaults arranged crossways, over the nave. This occurs in several places to the aisles, but I remember no other to the nave. S. Etienne, at Vignory, I have not seen, but Viollet-le-Duc assigns it to the tenth century. There is, however, a very good monograph of it in the Institute Library, by M. Girault de Prangey, who gives good reason for supposing that the church is not earlier than the beginning of the eleventh century. Even at this date, however, we have the first, so far as I am aware, of the chevet arrangement, and without any trace of its being copied, to my knowledge, from any existing building.

The main works of similar date in Italy are parts of S. Ciriacco, Ancona (a cross church), S. Fosca, in Torcello (also a domed church), and S. Ambrogio, at Milan; whilst in Germany there is little beyond parts of S. Pantaleone, at Cologne, and perhaps, parts of Mayence. I say *perhaps*, for when we come to investigate these early-dated buildings—to go through the history of their repeated rebuildings and reconstructions, we become painfully aware that nothing but an examination, stone by stone, on the spot, such as Professor Willis and others have given to our own buildings, can, with certainty, clear up their history.

We may, however, so far as our knowledge goes, take it for granted, that the beautiful arrangement of apsidal chapels appears in its earliest examples in the north-east of France at the end of the tenth century, or beginning of the eleventh.

The interest increases with the next century. In the tenth century nearly all the examples were drawn from the countries near the Rhone: but in the eleventh we must trace the awakening of our art in nearly every part of France, and can find noteworthy examples everywhere.

In Picardy and Normandy we have Bocherville, Jumièges, the abbeys of Caen, St. Lo, and others, all bearing strong signs of their Norman parentage, and being, in fact, more Norman than French, if we may so distinguish the parentage.

In Brittany there is comparatively little worth notice clearly identified with the eleventh century; and one is surprised to find that the same must be said of that tract of country so rich in memorials of the next two centuries, French Flanders and theI sle of France. Champage, Burgundy, Lorraine, and Alsace contain little more than Langres—a very large and interesting church with details clearly copied from classic remains (a good sketch of it is given by De Caumont)—S. Remi, at Rheims, which clearly shows a German feeling, and Notre Dame de la Coûture at Le Mans, which shows the most northern, to my knowledge, of the Angiovine churches without aisles. But get down further south and we have a most interesting series gradually appearing. We have in Anjou, Poitou, and the neighbourhood, Loches, Saumur, Villandry, that most interesting example, S. Hilaire, in Poitiers, and others.

Here we have clearly, so far as we can judge, in the eleventh century, the grand arrangement which we find in many of the old basilican churches, of the eastern end raised high above the western part. One finds too, in nearly all, the barrel vault, carried on great square sectioned ribs; the apsidal ends sometimes on the chevet plan, as at S. Hilaire, and sometimes in the plainer form of the simple apse to chancel and each aisle, as at Loches. And we find, too, the simple plan, so well known since as the Angiovine, of the cross church, without aisles, but with apsidal end and dome at the crux.

S. Hilaire and others, too, have their domes. All these churches are worth attentive study; S. Hilaire, in particular, seems to me to present as many picturesque features, shorn even as it is of its nave, as any church of the size that I know. Notre Dame de Nantilly, at Saumur, too, is a most interesting place, and if the date assigned to its roof (the eleventh century) be correct, it shows about the earliest case of the pointed arch, up north, that I am aware of.

Then we get down farther south to Guienne, and we find ourselves at once in a country where art has advanced in a degree that we should scarcely expect from the few examples northward. We find Souillac, Perigueux, Toulouse, Moissac, S. Croix at Bordeaux, Carcassonne, and others, all presenting the most picturesque effects of plan and section, and as a whole, very much beyond the general style of the more northern provinces.

Now here we meet for the first time, so far as I am aware, with well-recorded instances of the real Byzantine pendentives, as distinguished from the form used by more Eastern nations. This Byzantine form is so peculiar, difficult, and artificial altogether, as to render it very unlikely to be invented by the architects of such, comparatively, rudely constructed works as those which we here investigate. We find it at S. Sophia's and S. Marc's; but not all through Venice even; for S. Fosca, in Torcello, has the beginning of a dome which shows a strange sort of compromise between the Byzantine and Eastern, whilst that most interesting church, S. Ciriacco, at Ancona, has a dome which is altogether Eastern. I shall allude again to this peculiarity in tracing the history of art from the south.

Then again we find the prototype (we may almost say the original) of Notre Dame de Poitiers, in the earlier church of S. Croix at Bordeaux. We have the curious plan of Moissac, not Angiovine, but more like the southern one of Avignon, and above all, we have the glorious church of S. Sernin, at Toulouse, containing, though in a rude way, all the essentials of the finest cathedral, save and except the clerestory. Five aisles, the centre having a fine barrel vault, a cross plan, with aisles to the cross, apsidal chapels to the transepts, a bold apse with aisles, and five apsidal chapels leading from it.]

One cannot help regretting, in looking over this splendid church, and others akin to it, as one does too with the Renaissance churches of the Rhine, that so successful a beginning had not been further prosecued and well worked ont into a distinct style.

Now we come to Auvergne, a curious tract of country, distinct in its natural characteristics from the rest of France. It was first, I think, brought distinctly under notice in England by Professor Donaldson, and its main features have since been excellently described by Mr. Street. Both papers are amongst the Transactions of the Institute.

Clermont, Issoire, Brioude, and others, are most interesting, but they are so well known from the above and other works, that I will not detain you with them now. I ought, however, to remark, that two gentlemen of great knowledge in French art, Mr. Waring and Mr. Street, differ as to the claims of Auvergne as an art school. Mr. Waring considers it to be altogether indigenous and spreading its influence into the surrounding provinces; whereas Mr. Street assigns its origin to Eastern or Byzantine influence, like those which originated the style of Perigueux and others.

I now come to Provence, the most interesting district in France, to my mind, for Romanesque work, yet in the eleventh century it was scarcely so advanced as we might expect. We here find Valence, Avignon, Arles, S. Croix at Montmajeur, La Palud, Vienne, and others. These Provençal churches have, for the most part, a cross plan, round arches for the subordinate parts, no triforium or clerestory, the nave being covered with a pointed barrel vault, resting on massive unmoulded ribs. The section of the few mouldings used is Mediæval in some, quite Roman in others. But the ornaments are, almost invariably, traditional copies of Roman. We have, too, at Avignon, the dome combined with the pointed barred vault, and at the picturesque sepulchral chapel of Montmajeur, one of those seeming imitations of such old work as the tomb of Galla Placidia, the baptistery at Ratisbon, or the end of Mayence Cathedral, which make us doubt whether so clever a plan be original or not. The Avignon dome is, so far as I know, unique in the way in which the square plan of the dome drum is worked out from an oblong base. No Byzantine architect did that. It is Eastern altogether.

As this eleventh century is an important one in the history of our art, I will take a short review of its main features in France.

In the north we have a style pretty well developed by the Normans, who have left the clearly distinct traces of their work wherever their race could find a home, in England, and Sicily, as much as in Normandy. They get, so far as I can see, no share of their inspiration from the south. What was not their own was German. Then east, west, and south of this we find but little to remark until we come to the German provinces on the east, and approach Aquitaine to the south.

There we meet at once with the Venetian work as shown at Perigueux, Souillac, and Angoulême; and with the Eastern work as shown in nearly every other dome and in the pointed arches, and with details which show their copyism from the old provincial works of the Romans. I class them thus, for I have not the slightest doubt in my own mind that the use of the dome was altogether a revival that came from the East in the Middle Ages; the form of its pendentives being modified by the Roman architects of Byzantium, and as we see it at Perigueux, but showing their genuine Eastern origin in every other school with which I am acquainted.

It is the mixture of Roman, Norman, Rhenish, and Eastern art which makes the study of French so interestingly difficult, and results in so many picturesque arrangements in plan and outline. In the twelfth century we find art in Picardy and Normandy still Norman, but advanced, and slightly mixed with the pointed arch.

There is little in Brittany worth mention; but in central and northern France there are parts of Senlis, Noyon, Soissons, Laon, Bourges, Sens, Chartres, Le Mans, and S. Remi at Rheims.

In Anjou and Poitou we have the picturesque church of S. Nicholas; at Blois, the cathedrals of Tours and Angoulême.

In Guienne we have the portals and cloisters of Moissac, La Cité in Perigueux, &c.

In Auvergne, great part of Le Puy, &c.

And in Provence, the portals of Tarascon, S. Trophime at Arles, &c.

You will see by the above list that we are now in the era of great churches. Not that the great cathedrals were finished as we find them; but each has remains enough to show that those who first designed them were twelfth-century men at the latest, and that their designers meant them to be of the vast proportions which they assume now.

We find that the nave of Le Mans was then built of its present size, because the outer walls and arcades are original. Bourges, also, was designed to be of the same extent as we now see it, for the north and south doorways are of twelfth-century date. At Chartres, the great west front is of the same date. The great churches of S. Remi, at Rheims in the north, and Toulouse in the south, were earlier. Still, I doubt whether a more interesting series could be found than we see in ranging from north to south through these great French churches.

The fact of the great size of the churches at this date and earlier seems to interfere a good deal with M. Viollet-le-Duc's theory as to the thirteenth century work. He describes the cathedrals of that date as being rebuilt in consequence of the great and sudden efforts made during the enfranchisement of the towns, their great increase of wealth and population having led to the rebuilding on so vast a scale of their cathedrals. It did undoubtedly lead to their being rebuilt in a much more *ornate* manner, but the size had been set in the olden times long before.

Start at the extreme north, and we are stopped at once at Laon, one of the grandest as well most ancient of these works,—almost superior in the beauty of its site even to Durham. It stands on a spur of a long range of hills, with a steep escarpment from the plain, and you ascend straight up the face of the rock by ranges of stairs, one only having no less than 260 steps. The face of the cliff is terraced off and clothed with vineyards, and high above you as you ascend, towering above all around it, and standing boldly and grandly out, with its towers against the sky, stands the grand church of Laon.

I know of no work more beautiful or nobler of the age,—noble in the magnificence of its outline, and beautiful in the richness of its detail. The date is given, in the guide-books, as 1114, and it is said not to have been altered since.

Nearly every arch is pointed, and it is so Gothic in its general feeling, so advanced in many of its details, that it is scarcely possible to credit its date to be so early. M. Viollet-le-Duc, indeed, considers that it was almost destroyed before 1190, and rebuilt *circ.* 1200, and that quite harmonizes with its present appearance. The shafting to the piers is so delicate in form as almost to be painfully so in parts, those of the nave especially. The mouldings are those so well known in later times, and much of the enrichment is beautifully graceful, though the capitals retain much of the Romanesque in their foliage. The only thing wanted to complete the Gothic, is tracery to the windows; and were the church restored in its integrity, or finished as designed, one thing only would be required to make it almost perfect,—the chevet in place of the straight end. Laon altogether may be described as being thoroughly Gothic in outline, with much more Romanesque in detail than works of the same date with us. It is a marvel in art, and presents a subject well worth the most attentive study. Only a few miles from it is Noyon, almost perfect in plan, but wanting the picturesque towers of Laon.

Farther south, and about level with each other, are Senlis, between Noyon and Paris, and S. Remi, at Rheims, much more to the east both Romanesque, but S. Remi has strong marks (in its tower particularly) of the German influences which we should expect to find there. Then we find at Paris a still more curious contrast in style and dates, for we have in the earlier parts of S. Denis a great approach towards the perfect Gothic, whereas, within a short distance of it, there remains the church of S. Germain des Près, built twenty years later, and perfectly Romanesque. This curious fact was brought very prominently forward by Mr. Scott, in his Royal Academy lectures. But still more curious is the history of S. Germain, as told by the writers upon it; for they give clear and positive accounts of the church having been altogether rebuilt in the seventeenth century. I cannot account for these statements, and merely bring them forward as not to be forgotten. The church is well known to me, and I do not believe that any restoration such as this must have been could have been carried out at the date assigned to it, or even now; but, as the church is a most important one, the statements above alluded to should be known.

A little south of Paris we get Sens to the east, and Chartres to the west; Sens Transitional, but Chartres pure Romanesque in its sculptured porch and west front.

A little farther south and we come to the nave of the great cathedral of Le Mans, near Chartres. This, too, is one that requires very strict examination on the spot. The arches over columns have clearly been put in round, the pointed arches of mouldings having been introduced afterwards; and it seemed to me, on close scrutiny, from a seeming alteration in the curve of the main arch ribs spanning the nave, that they were put in, at first round up nearly to the apex, and then the summit altered into a point. I have a very strong impression that the whole of this nave was finished at or near the end of the eleventh century, and that we have in it the nearest approach in these parts to the true basilican outline of the nave, it having been altered only as we find it in the twelfth century. A very little farther south and we come on the Loire, to Angers and Tours cathedrals, and S. Nicholas, Blois.

Tours was late in the century, and the earlier part is of well-advanced Gothic. But Angers and S. Nicholas seem much earlier, and present very noteable features. Angers has the bold cross, aisleless plan of Angoulême, but without its domes, the church, of some 50 feet span, being vaulted with high domical vaults, and nearly all the arches pointed: the ornamentation very rich and beautifully carved.

But Angers contains very much of early date of extreme interest. S. Serge, for instance, the choir whereof is said to be still earlier than the cathedral, and yet is designed with an elegance and lightness that makes its feeling Gothic altogether. In fact, there are very few specimens of our Pointed architecture to equal it in lightness. Then, in S. Nicholas at Blois, we find the southern dome combined with the northern chevet, the arches partly pointed and partly round, and the dome itself most curiously formed in a half-Byzantine, half-Eastern way. Blois is just at the midway between northern and southern influences, and its architecture is influenced just as we might expect.

South a little farther, but more to the east, and out of the direct reach of mediæval traffic, is the magnificent church of Bourges. This is chiefly of later date than the twelfth century, but there still stand, little the worse for their 700 years' wear, the two grand portals, north and south, and in them you have the stiff archaic sculpture of the time. Bourges is now in the very heart of France, but it was, at that time, an outlying post in a barren country, and one does not look for nor find much progress there. Southward again, in the direct track of trade, we come to Poitiers—southward still of that, to Angoulême; both too well known to need much notice here. Poitiers is northern in its domical vaulting, and southern in the want of clerestory and triforium. Angoulême has the northern chevet, the Angiovine aisleless plan, and the altogether southern domes. These domes are Byzantine altogether. And now, for my last examples, we reach Moissac, Tarascon, and Arles, all in the great southern province; no trace there of northern art; no fine lights and shadows from clerestory and triforium; no boldly soaring towers; no beautifully-planned apse. We miss all these down south, but we have, instead, the bold and graceful portals and the richly-sculptured cloisters—so lavish in their decorations, so elegant in their carvings, that one almost forgets the contrast between Arles and Laon, in the wonderful interest which the carvings of these small southern churches excites.

Now I want to lead you, before we come to the great works of the thirteenth century, to examine again the course of the art-changes up to the end of the twelfth. First, then, we find Normandy, as before, still, to a certain extent, isolated in art, not borrowing from or influencing other provinces, and still keeping its own peculiar style, be the origin of it what it may. But it and its arts seem to have influenced us. Secondly, then, at the time when we had only such archaic work as we see at Durham, Peterborough, and Norwich, there had been finished a large part of the great Pointed church of S. Denis.

But the Angers Pointed churches must have been earlier still: and earlier still than those were Avignon and other pointed vaults still farther south. We must call to mind that most of the buildings, Christian and Saracenic—and grand ones they are—wherein the Easterns had a hand, as Sicily, and Egypt, and Syria, were, long before, all Pointed in their arches. In Italy, even in the north, all was strictly still Romanesque and round-arched. But, though the true Gothic seems to have been begun in France, it was only in the north that the style had taken root. Little of it is to be found south of Paris, for the Pointed arch in the southern provinces was used with no Gothic feeling. It marks, however, the influence of commerce upon art, in that the nearest to it, perhaps, is to be found in Angers, the chief town northward in the general route. Now, up to this time, it seems to me that this advance in Gothic was altogether French; at least, I know of no other place from which the style could have been borrowed: from Germany it certainly was not. All that I have ever seen or heard of it was Romanesque—Romanesque of a very peculiar and beautiful style; very Eastern much of it, and containing some of the finest specimens of plan and outline that the world has ever seen; but no Gothic was there. It did not come from England. Few of our works here are even Transition, and we cannot call such buildings Gothic.

It did not come from Italy, for nothing there is to be found that is not Romanesque. To France, too, we must, I think, give the honour of designing the great sculptured portals, such as we find in this country at Arles and Tarascon (most carefully described by Mr. Waring at the Institute, in 1860), and the earliest of these are at Bourges and Strasburg. Somewhat near to them in date are those of S. M. Toscanella and Verona. But these are very different in arrangement from the French—combine less harmoniously with the general mass; and, although the French and Italians of those times may have interchanged ideas, it seems to me that the French architects of Southern France may fairly claim the merit of their design, and nothing that I know is more rich and graceful.

It is clear, however, that there was, as I have before suggested, an interchange of thought between the art-workers of France and Italy, because, in addition to the twelfth century being the age of porches in both countries, we find, also, in both, the strangely conventional introduction, under the columns, of lions and other animals. This lasted in Italy to the fifteenth century, one of the most magnificent specimens being the porch at Ancona. To sum up—the French works of the twelfth century, as a rule, were more powerful than graceful—more bold than studied—less marked as a distinct epoch by mouldings, or outlines, or plans, but free in all to an extent that no age, before or since, perhaps, has known.

The architect in Provence, Auvergne, and Anjou, was a singularly unfettered man. He took for his plan the cross form or the oblong, with or without aisles, as it but answered his purpose or his funds. He turned his lower arches in the round form which his fathers used, covered his great church with the northern groin or the southern barrel vault, and sometimes with both together, and formed these groins or vaults with the Pointed arch. Then, upon that, if he wished for a bolder form, he raised the dome, with its pendentives borrowed from the East, and finished the great work by the radiating chapels which led to the glorious French *chevet*. And then he lavished upon the entrance to this church all the efforts which sculpture could make, and which were the beginnings of that work which culminated in the portals of Rheims and Bourges. Where, too, shall we find such studies in aftertimes as those that we get in the cloisters of Arles and Moissac? Rude they are,—rough,—not to be looked at for studies of anatomy or graceful drapery (though you may find that too), or for all the delicate refinements of the sculptor's art. But what a study there is of the men who wrought them! What lessons in store do they teach. Walk through those cloisters; and, as you look at each capital, the mind can find a separate subject to learn from or instruct. The Greek never did this, nor did the Roman. Not even did the men of a century later! Compare, for instance, the carving in the cloisters of S. Trophime with that of the later cloisters of the Augustines at Toulouse—a wretched falling off. I don't say copy these rude works; but I do say, work as they worked, with our superior knowledge as a help to us, and we shall do well.

Now for the thirteenth century, the last that one can well study in France, for art ran to riot very quickly afterwards; and, though much of the after work is beautiful, almost to perfectness, yet there is so much waste, if I may use the term, in its beauty, that one can scarcely well go very deeply into it; at least I, for one, never could; and I shall, therefore, now confine myself almost to the thirteenth century, with a general glance only at the after work. The thirteenth century is the date of Philip Augustus and S. Louis—of Philip the Bold and Philip le Bel—of the conquest by the French of the English provinces, north and south—of Provence and Champagne—of the Crusade in Languedoc, and the destruction of the great order of the Templars. It reached from our John to our Edward I.—from Norwich cathedral to Salisbury, Wells, Lincoln, and Westminster—the nave of York and the Eleanor crosses.

In Germany, it gave us many of the Cologne churches, with part of the cathedral itself;—in Italy, the Baptistery at Parma, S. Francesco at Assisi, the Campo Santo and Baptistery at Pisa;—in Spain, the Alhambra. It is the great era which M. Viollet-le-Duc brings forward as the age of prodigious activity in art—when the grandest of the French works were undertaken with the most marvellous powers of design and richness of detail; but done, he says, in a hurried way, so that both the construction and details were wanting in that perfect finish which characterized the earlier works: and it is the time at which the purest Pointed architecture is to be found in Europe. Of this era are the chief parts of the great French churches of Amiens, Bayeux, Rheims, Chartres, Le Mans, Strasburg, Tours, Poitiers, Limoges, Bordeaux, Toulouse, and Alby, the walls of Carcassonne, and many other works that give life and interest to the city or the landscape. Here again, as before, we find a difference, strongly marked, between the north and the south; but the strength of the south had now died out, and all the energy of design had passed to the north. There is, indeed, much of great interest in the south: the great churches of a single plan, and of one aisle only—marvels of construction, and valuable for study for our Anglican service. So, too, there is much to be learned from the brick architecture of Toulouse and its neighbourhood—a style quite peculiar to it, and not much known. But, nevertheless, the great move in architecture and sculpture in the thirteenth century was in the north, and to their architects, I think, belongs the credit of the movement.

The change, however, in France, was scarcely so great as with us, from the style preceding; and it was, to a much greater degree than with us, a mere refinement on the century before. We find the mouldings, to a great extent, very similar in both—the foliage to the capitals very much the same; so, also, the general contour of the buildings, the sculptured porches, the lofty spires All had been shadowed out before very much more than with us, and though they had got the start of us in the twelfth century, I think that we had overtaken and outstripped them in the thirteenth.

To begin, now, with the details, the most important point, although the most minute in any comparison of work and dates.

No one studying the subject can fail to see at once that the change of details made in France is very much less than with us. The mouldings most in use continued with them to be almost the same; and one finds the sections that were used at S. Denis, in the middle of the twelfth century used still at Chartres in the middle of the thirteenth, with very little change indeed. Yet that length of time is very similar to that between our St. Cross and Westminster—between the Norman section of the one and the elegant Pointed section of the other. So, too, with the foliage. From a very early period in the twelfth century to a later period in the thirteenth, much of the foliage of the capitals was very similar throughout; and though the latter work was somewhat freer and less archaic than the earlier, yet the general form was still the same. Compare this, now, with the difference between the same buildings that I have before named, or with the heavy work of Peterborough transepts and the Chapter-house of Salisbury and York. This great adhesion to a settled type of work presents much greater difficulty to any student investigating the theory of dates in France than he meets with in Great Britain, and it is somewhat dangerous to speculate too closely upon French dates from such details. It is, indeed, captivating when we find, as we do when first we begin our studies in architecture, that the mere contour of a moulding, or the turn of a leaf, will sometimes fix a building's date within some twenty years; and one is sorely tempted to theorise thereon somewhat too confidently in setling to our minds a doubtful date. But a larger study will often show that a little knowledge here, as in many other things, is a dangerous thing—not to have, but to theorise upon; and the actual facts of a given proved date. will often show how much we must assign of influence to local types and peculiarities. Knowledge makes us modest in this as in all things else.

In France, however, so far as I can see, study has taken a path quite different; for details there seem to be studied by the French in quite a secondary way. I do not know a single French work which gives the detailed mouldings to any workable size.

This, however, is a digression.

Compare such of the French mouldings as I have given, and which are perfectly fair specimens, with any of our works of the same date, and the difference will be found very striking in favour of the advancement in England.

As to the capitals, the magnificent series of drawings which Mr. Scott has been kind enough to lend me, and to which I shall allude in conclusion, will show at a glance the various differences of form and foliage.

But then there comes the tracery of the windows, and I am afraid that the French had clearly the start of us there. I must, however, doubt whether they had much start of us in their sculpture. Wells Cathedral was about equal in date to most of the great French churches; and the sculpture there will hold its own, I apprehend, with any. Take, as an instance, its sculpture as compared with Chartres. Comparisons are, however, rendered somewhat difficult by the uncertainty of the dates themselves in many of the examples best known. Take, for instance, Amiens, better known and more written about, perhaps, than any other, from its nearness to our own land, and its reputed date, so temptingly near to Salisbury. The latter was begun 1220, and finished some forty years after, on one plan. Amiens about the same, but the works there are said to have extended to 1272; and then again, after a severe fire, to have been renewed in the fifteenth century. Now, there can be no doubt whatever that a total change of the aisle plans took place after the main skeleton of Amiens was up, because the outline of the buttresses, clearly meant to be external, can still be seen *within* the chapels—this plan adding, in fact, another aisle to the whole building, and pushing outwards the whole of the lower walls. These latter, therefore, with the whole of the lower windows, aisle, groining, &c., must have been added after the general skeleton of the cathedral was finished. I think, too, that any one carefully examining the details will say that the work externally, above the canopies of the great portals, is later, to a marked extent, than the figures below. Also, that the whole of the capitals to the traceried windows throughout are very much later than the general skeleton of the building; so are the parapets. Much, too, inside is clearly of a later date, so that, until the history of this great church is much more closely written from the stones themselves than has, I think, been done, we must scarcely take it as a good foundation for a theory of date comparisons. We may, however, do something more by comparing it with other French works. I did so with Tours and Chartres particularly, and found the piers, capitals, abaci, groining, and many other parts, to be almost identical with one or other of these two cathedrals.

Now, the date of Chartres and of Tours is about the same, viz., 1250, and I do not think that we should put the upper part of Amiens at all earlier—the tracery of the windows, the parapets, and the west front decidedly later. This middle of the thirteenth century, then, affords us a most excellent standing point of comparison between Amiens, Tours, and Chartres of that date, Westminster and other English examples of the same time, Paris a few years earlier, and Laon of a few years earlier still. The result is curious; for if you take the mouldings and the general lightness of the style as evidence only, the earliest, Laon, would really seem more advanced than the other French examples. The capitals are freer at the later date, but scarcely so finely modelled, I think; and most decidedly the ornamental work of Laon, in the exterior, exceeds by far the rest. The early French work, in fact, in general, shows such broad surfaces, and is so little cut with mouldings, that I am constantly reminded of Mr. Burges's remark, that, we must choose between colour and mouldings, and cannot have both—the French preferring the colour. It is not, however, very easy to find genuine examples for the study of colouring in the interior of the old French churches. There are, indeed, very many and large traces of it in many places. I may mention S. Hilaire, at Poitiers, and the Cathedral of Tours in particular. But it requires very great care in discriminating as to what was done at the time, or nearly so, of the building, and what was added afterwards in Renaissance times (often *upon* the first), when decoration was used in France most lavishly. Then all was whitewashed over, and it is sometimes no easy work to say, until we come to some decided ornament, to what date we must assign the painting.

To resume as to the comparison of dates, we may, I think, be quite safe in concluding that the Pointed style in France was developed at an earlier period there than with us, but that, in our mouldings and our foliage, it advanced with us to a greater degree of delicacy, refinement, and beauty of details, than ever it did in France. I know of nothing in France that will equal in grace and delicate beauty the Early English foliage capitals, or the beauty of the spandrels and other ornaments that we see at Lincoln or Westminster, or the Chapter-houses of Salisbury and of York, for instance. The French are, no doubt, gloriously vigorous, as Mr. Scott's fine drawings here show. Their piers and mouldings, too, are bold enough, but they always seem to me to have scarcely the richness that one would expect to find in them. I mean, of course, up to and including the thirteenth century, for there was no lack of richness after,—it then ran quite to riot in its details. I should not care to trouble you much with this, even were there time; for, beautiful as much of the detail is, and picturesque as are many of its effects, there seems throughout to be so much in it of the artificial, that its study is soon abandoned. Much of the very late work, quite of the Renaissance, is very picturesque in outline, and the skylines of the roof afford, very often, quite wonderful studies. I give a few examples, enlarged from my sketches.

Before quite concluding, I should like to make a few general remarks on the French works:—First, with respect to the general outline, there is no one, I suppose, who does not know the wonderfully elegant flying buttresses of Chartres, for instance, which tell so well in a section. Beautiful they are in drawing, and fine as constructive works. But the real effect, more especially at the apsidal ends, is by no means so good. In many cases (I noticed it particularly at Chartres itself, and at Le Mans) the buttresses are so close together, and reach so nearly to the parapet or eaves, as quite to exclude the windows and the wall-lines from most points of view. There is at Le Mans a good opportunity of comparing the effects of these heavily-buttressed apsidal ends with the simpler form of an earlier date; for the Lady-chapel there is shown projecting its simple apsidal outline in direct contrast with the flying buttressed end of the church; and, certainly, I could not hesitate to say that the earlier simple form was the most pleasing. Then the excessive height of the French cathedrals seems to require such depth in the buttresses as, in many cases, to obscure the side walls, as I have above described they do the apse.

Then, again, the triforium is treated, generally, in a very different way to ours. We have, as a rule, in our early work, a deep practicable gallery, lighted from the back, low in height compared with the aisles and the clerestory, and giving thus a scale to the whole of great value. The darkness, too, offers a fine contrast to the lightnesss of the clerestory over.

In France, as a rule, the triforium is a mere gallery in the thickness of the walls, and is glazed throughout. Great lightness is, of course, the result, but one misses much the deep shadow of our own cathedrals. This great lightness, too, has another defect, viz., that the great solid piers of the nave and choir seem too heavy for their work. This is particularly the case, I noticed, at Bourges, and the effect is increased by the want of massiveness as well as richness, in the effect of the great aisle arch mouldings. On the other side, however, the French have many advantages over our plans. No one can, I think, contrast our square-ended churches, as compared with the French apse and chevet without feeling the superiority of the French plan.

In a few instances, as at Strasbourg and S. Hilaire, Poitiers, the Italian arrangement of apsidal end, raised above the Saints' Confessional, is to be found. But, in general, the French plan is strictly a congregational one, the aisle being continued round the apse as a regular path. Then, externally, we have in French works, the great crowning cornices—a feature of very great importance, and that gives a remarkably bold finish to the walls. This is found, too, in the domestic work as well as ecclesiastical, and in work of all dates. It deserves attentive study, both for detail and for general effect; and seems to supply the only want (and to my mind a very great want) which we find in the great Gothic palaces of Venice, viz., that of a great crowning cornice. Finally, we have the domical vaulting—a beautiful variety of groining in itself for one compartment seen separately, but very difficult to manage well when seen in a long succession of bays.

I must say a few words now as to the French glass. Many of the cathedrals are filled with it to an extent which we really cannot understand, when we think of the many vicissitudes that France has undergone, and one sees, especially, the actual treatment of whole ranges of great, untraceried windows of the twelfth and thirteenth centuries, as decorated with glass of the finest character.

Usually it is divided off, as in our own early glass, into geometrical medallion patterns, with deep rich borders—the medallions filled with figure subjects, and the spandrels, &c., with a peculiar sort of plain diaper, almost invariably of blue and red.

Wherever the medallions and diapers are of much the same tone of colour, the general effect is that of a somewhat confused mass, owing to the smallness of the details. In such a case, the large single-figure lights of the later glass contrast favourably with the earlier. But when (as is usually the case) the latter have the medallions brought distinctly out by their contrast with the deeply-coloured diaper ground, the window so marked out produces all the picturesque effect of a traceried window, with the power of colour superadded. The borders are very beautiful in design, but the diaper which I have already alluded to takes very badly the place of our scroll-work. Sometimes, as at Strasburg, the glass is so thick with age, that the obscurity is too great. But, in general, the effect of the cathedrals lighted by ranges of such glorious windows as one often sees in France is a thing never to be forgotten, and affords means of comparing the general effect of glass of various dates which one can scarcely find elsewhere. Of one thing I must warn the young student, in prosecuting his studies in France. He will find that many churches, ancient or restored, have the vaults and masonry strongly lined with deep white or red lines. In very many cases this is really old, in the vaults especially; for there, the spaces between the ribs, being filled with chalk or light stone in irregular lumps, were plastered over with a thin plaster and lined. I think that this was done as a means of decoration, and a legitimate one. It certainly has a very good effect in general.

But the French architects of the present day often make a point of plastering over the masonry, wherever irregular, of the walls, with similar plastering, so closely resembling stone, as to be very deceptive, and then lining it over in regular courses, quite irrespective of the actual joints of the masonry. I saw a ludicrous example of this at Saumur, for the piers had been jointed at different heights at the sides, and were often at a wide distance apart at the angles. Used properly, the showing the actual lines of the stones has an excellent effect, better, in fact, than one could expect. There is a striking proof of it in part of the early arcade, at Le Mans, where three of the arches only have been thus lined, the rest retaining their old coat of whitewash. The difference is wonderful.

I now come to the fine series of capitals lent to me by Mr. Scott. In his lecture at the Royal Academy, he brought forward very prominently their general characteristics, as being chiefly derived from Byzantium. You are quite aware that the French foliated capitals are very different from ours. We seldom see in France such beautiful and elegant work as we do here; but then the French is, as a rule, bolder; and I know of nothing in other countries quite like them in general design. They are, as Mr. Scott describes them, Corinthianesque, but not mere bad imitations of Corinthian. One seldom sees, for instance, the caulicoli at all. There is one instance from my sketch at Le Mans;

and one finds them in early examples, as at Caen, for instance; but very rarely indeed in thirteenth century work; and although the general outline often suggests its Corinthian origin, yet these capitals, as a class, may fairly be ranked as genuine French work in design. Yet I quite agree with Mr. Scott's idea as to their Byzantine origin, and (after comparing notes with him) find that I do so from a different point of view altogether. Mr. Scott was struck with the general resemblance of the French capitals to the Byzantine rendering of Roman work, whereas I had invariably classed them as Byzantine owing to their peculiarity of sculpture.

There is a mannered style of manipulation found in nearly all the Byzantine work that I have seen which is rather difficult to describe, but is very evident in most examples. The lines are cut in very sharply and squarely; the eyes of the leaves and other points wanting emphasis are drilled in deeply, and the whole effect is that of a wish to give as much sharpness as possible, so as to bring out the work when seen at a distance. This gives a certain kind of stiffness to the work, but it is most so in the subordinate parts, the general curves and outlines being often as graceful as they are bold. Of course, these details of execution are not to be found throughout. The French school was evidently soon an independent one, preserving only in parts the traditionary style of work. But it is so clear that I feel no doubt whatever, looking at the matter from quite a different point of view to Mr. Scott, that Byzantine influenced French art, as I believe it did all other art, down to the thirteenth century at least. The French school soon then formed quite an independent style of its own, as you may see by the drawings of the Sainte Chapelle. I must, however. in fairness say, that there is a good deal of French work of by no means the high character that one usually sees, simply because one does not care to draw from bad examples. Much of the work, even at Chartres, for instance, is very coarse and poor.

I have alluded in this rapid sketch to ecclesiastical architecture only; for, to notice architecture in its domestic or military phases would have been too great a task for this short space. But I must remark that the same feeling for bold, horizontal, crowning lines, is shown even more in secular than in other works. You find the great crowning cornices used with a wonderfully good effect. Take, for instance, the Hôtel de Ville, at Bourges. It tells most capitally as a finish to the florid enrichments of the front, which would, in fact, be strangely overcharged without it. So, also, the door and window openings are often spanned by a bold, straight lintel, carried, perhaps, through the whole front, with no attempt whatever to disguise it in any way by an arch. It is simply a plain, straight piece of stone, clearly strong enough to do its work, and contrasting well with the arches of the other openings. This horizontality is a strong feature throughout French Gothic, and seems to pervade it even to the design of their most upright features,—the pinnacles and spires.

To sum up. Whilst English Gothic has its own great beauties—such as its delicate and graceful foliage, its splendid suits of mouldings, and its beautiful Decorated work, with all the elegance of the Flamboyant without its extravagance; and, whilst I hold that the beauty of such works of ours as Westminster and Lincoln, Salisbury and Wells cannot be exceeded, it must be granted that the French has likewise beauties in its Early art that ours wants. The great rose windows, the bold capitals, the grandly-sculptured portals of the north, and the Romanesque work of the south, may all be claimed by France as her own. This is as it should be. Art varies with the climate and the race; and far be it from us to wish that it should be otherwise, or that such differences should not produce peculiar beauties in each land.

One word I must say as to the men to whom we owe them—the architects. These men of old are honoured still in France. The relic in all Rheims most noteworthy, perhaps, is the incised tomb of Libergius, the architect of its great church. That survives the stormy times that saw the monuments of S. Denis broken to powder, and as you walk up the wide new street which will soon afford a fitting entry to the cathedral, you will see that it is named after its architect. Can any one—can we above all—looking at such works as his, believe, for one moment,—the lowering theory constantly put by the clever author of the "Handbook of Architecture," (and my very good friend),—that they were not the products of genius and study, such as were the sculpture and the painting, but merely advanced products of the technic art?—putting, in fact, the men who adorned the portals with their figures of stone, and decorated the shrines with colour, above him who designed the whole. To me it is a marvel that the gifted author I have mentioned could think, for a moment, seriously, that the designers of these glorious works which fill their beholders with wonder, and admiration, and awe, could be other than amongst the highest, in the fulness of their intellectual power.

And now, in bringing to a close this sketch, which must, from its nature, be somewhat bare, I cannot avoid saying a few words as to the country of which I have been speaking. I have travelled as much as most men, in most European countries; but in none have I found, as an utter stranger, a more kindly welcome than in France. A mischance may sometimes happen (and where in life may it not?), and sometimes one may meet with a surly neighbour, or ill-tempered host; and sometimes, possibly (though it has not fallen to my lot) one may meet with a lingering trace of the feeling that France and England are not quite friends.

But set out on your travels with a full intention of pleasing and being pleased—adapt yourself to the customs of the land, and respect them when they differ from ours—and I know of no place, save our own land, where you will meet with more kindness, more thorough friendliness, than you will in gay, sunny France.

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